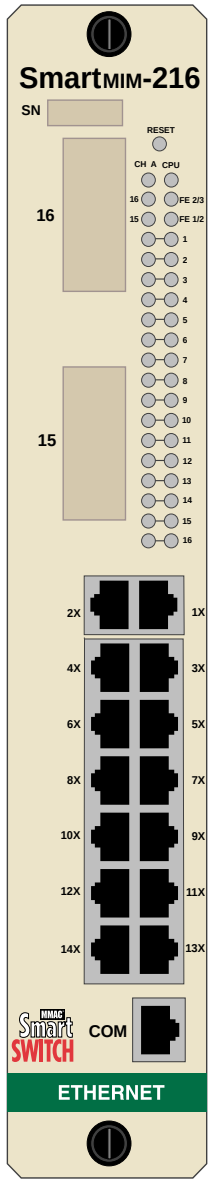
# SmartMIM-216
# SmartSwitch 10/100
# USER'S GUIDE

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Order Number: 9032007-02 March 1997



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## SAFETY INFORMATION

## CLASS 1 LASER TRANSCEIVERS

## THE FE-100F3 FAST ETHERNET INTERFACE MODULE USES CLASS 1 LASER TRANSCEIVERS. READ THE FOLLOWING SAFETY INFORMATION BEFORE INSTALLING OR OPERATING THESE ADAPTERS.

The Class 1 laser transceivers use an optical feedback loop to maintain Class 1 operation limits. This control loop eliminates the need for maintenance checks or adjustments. The output is factory set, and does not allow any user adjustment. Class 1 Laser transceivers comply with the following safety standards:

- 21 CFR 1040.10 and 1040.11 U.S. Department of Health and Human Services (FDA).
- IEC Publication 825 (International Electrotechnical Commission).
- CENELEC EN 60825 (European Committee for Electrotechnical Standardization).

When operating within their performance limitations, laser transceiver output meets the Class 1 accessible emission limit of all three standards. Class 1 levels of laser radiation are not considered hazardous.

## SAFETY INFORMATION

## CLASS 1 LASER TRANSCEIVERS

## LASER RADIATION AND CONNECTORS

When the connector is in place, all laser radiation remains within the fiber. The maximum amount of radiant power exiting the fiber (under normal conditions) is -12.6 dBm or 55 x $10^{-6}$ watts.

Removing the optical connector from the transceiver allows laser radiation to emit directly from the optical port. The maximum radiance from the optical port (under worst case conditions) is 0.8 W $cm^{-2}$ or 8 x $10^{3}$ W $m^{2}$ sr-1.

**Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.**

## DECLARATION OF CONFORMITY

| | |
|---|---|
| Application of Council Directive(s): | **89/336/EEC**<br>**73/23/EEC** |
| Manufacturer's Name: | **Cabletron Systems, Inc.** |
| Manufacturer's Address: | **35 Industrial Way**<br>**PO Box 5005**<br>**Rochester, NH 03867** |
| European Representative Name: | **Mr. J. Solari** |
| European Representative Address: | **Cabletron Systems Limited**<br>**Nexus House, Newbury Business Park**<br>**London Road, Newbury**<br>**Berkshire RG13 2PZ, England** |
| Conformance to Directive(s)/Product Standards: | **EC Directive 89/336/EEC**<br>**EC Directive 73/23/EEC**<br>**EN 55022**<br>**EN 50082-1**<br>**EN 60950** |
| Equipment Type/Environment: | **Networking Equipment, for use in a Commercial or Light Industrial Environment.** |

We the undersigned, hereby declare, under our sole responsibility, that the equipment packaged with this notice conforms to the above directives.

| Manufacturer | Legal Representative in Europe |
|---|---|
| Mr. Ronald Fotino | Mr. J. Solari |
| Full Name | Full Name |
| Principal Compliance Engineer | Managing Director - E.M.E.A. |
| Title | Title |
| Rochester, NH, USA | Newbury, Berkshire, England |
| Location | Location |

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**CHAPTER 4 TROUBLESHOOTING**



**CHAPTER 5 LOCAL MANAGEMENT**

# CHAPTER 1
# INTRODUCTION

Welcome to the Cabletron Systems **SmartMIM-216 SmartSwitch 10/100 User's Guide**. This guide describes the SmartMIM-216 SmartSwitch and provides information concerning network requirements, installation, troubleshooting, and the use of Local Management.

## 1.1 USING THIS GUIDE

Read through this guide completely to understand the SmartMIM-216 SmartSwitch features, capabilities, and Local Management functions. A general working knowledge of Ethernet and IEEE 802.3 type data communications networks and their physical layer components is helpful when using this device.


In this document, the SmartMIM-216 SmartSwitch is referred to as either the "SmartMIM-216" or the "device."

## 1.2 STRUCTURE OF THIS GUIDE

This guide is organized as follows:

Chapter 1, **Introduction**, outlines the contents of this manual and briefly describes the SmartMIM-216 features. Directions about how to obtain additional help and a list of related manuals are also included.

Chapter 2, **Network Requirements**, explains the network requirements to consider before installing the SmartMIM-216.

Chapter 3, **Installation**, provides instructions on how to install the unit and connect segments to the device.

Chapter 4, **Troubleshooting**, details the SmartMIM-216 LANVIEW LEDs that enable you to quickly diagnose network/operational problems.

Chapter 5, **Local Management**, describes how to access Local Management (LM) and use the Local Management screens to set up and manage the SmartMIM-216.

Appendix A, **Specifications**, contains information on functionality and operating specifications, connector pinouts, environmental requirements, and physical properties.

Appendix B, **FE-100TX, FE-100FX, and FE-100F3 Specifications**, contains information about FE-100TX pinouts and the cable types used with the FE-100FX and FE-100F3.

Appendix C, **Fast Ethernet Interface Modules Installation**, describes how to install optional Fast Ethernet Interface Modules.

Appendix D, **About SmartTrunk**, describes how SmartTrunk operates.

## 1.3 SmartMIM-216 FEATURES

The SmartMIM-216 (Figure 1-1) includes the following features:

- A 14-port, high-speed workgroup switch with two optional ports for Fast Ethernet Interface Modules to provide high speed uplinks to 100 Mbps Fast Ethernet technologies
- Full Duplex Switched Ethernet (FDSE) support for Fast Ethernet links to bandwidth intensive users/servers
- SmartTrunk, which allows the logical grouping of interfaces on the SmartMIM-216 via LM to provide a higher aggregate bandwidth for traffic between Cabletron Systems devices that support the SmartTrunk feature.
- Runtime IP Address Discovery, which allows the SmartMIM-216 to send out a Reverse Address Resolution (RARP) and BootP Protocol (BootP) requests to determine its Internet Protocol (IP) address
- Simple Network Management Protocol (SNMP) and Remote Monitoring (RMON) Manageability
- Support for traditional switching services as well as for Cabletron Systems SECUREFAST Switching Virtual Network technology
- Ability to link existing stackable or third party hubs to 100 Mbps Fast Ethernet backbones
- IEEE 802.3 compatibility with support for IEEE 802.1d and DEC Spanning Tree Algorithms
- LANVIEW Diagnostic LEDs

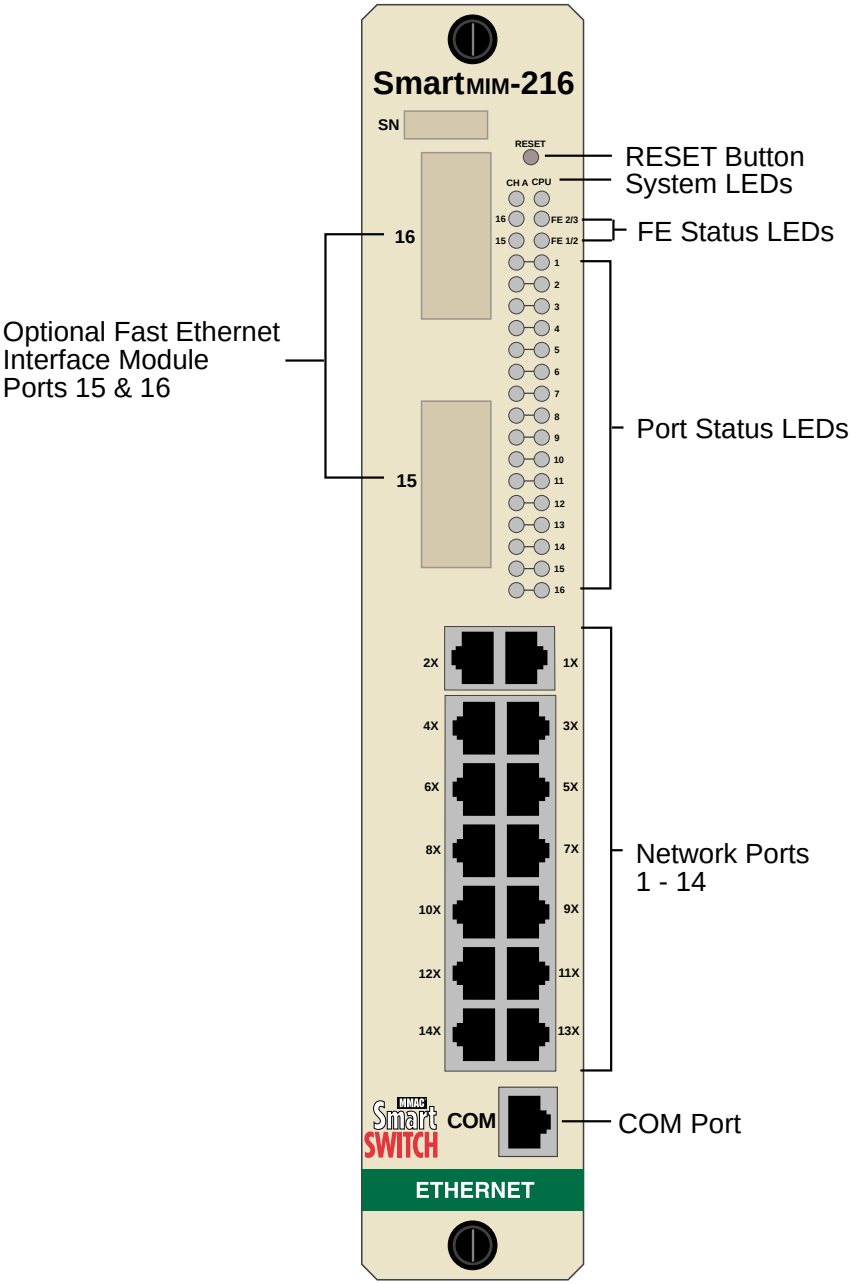



**Figure 1-1 The SmartMIM-216**

## 1.4 SmartMIM-216 OVERVIEW

The SmartMIM-216 is a 16-port high-speed network switching device that supports traditional switching (bridging). Ports 15 and 16 support optional Fast Ethernet Interface Modules and can provide uplinks to 100BASE-TX or 100BASE-FX Fast Ethernet networks. The switching function of Port 1 can be redirected to the backplane Channel “A”. Ports 15 and 16 can be redirected to the backplane Fast Ethernet Channels.

### 1.4.1 Connectivity

The SmartMIM-216 connects to Ethernet networks or workstations through fourteen RJ45 ports on the front panel. These ports support Unshielded Twisted Pair (UTP) and Shielded Twisted Pair (STP) cables at lengths up to 100 meters. The ports are IEEE 802.3 10BASE-T compliant.

The SmartMIM-216 has two front panel slots (ports 15 and 16) for optional Fast Ethernet Interface Modules to support an uplink to 10/100 Mbps Ethernet backbones or a high speed connection to a local server.

### 1.4.2 Channel A

The SmartMIM-216 can connect to Channel A in the MMAC chassis for management purposes as well as for network switching operations.

If the user is managing the hub from an existing connection to an Ethernet management module in slot 1, the ability to redirect the switching function of SmartMIM-216 port 1 to Channel A allows that user to manage the SmartMIM-216 and connect to its current users. The “A” channel allows network frames to reach the SmartMIM-216 without the need of a front panel connection.

The Channel A connection switches frames from the SmartMIM-216 to the existing chassis Channel A network. However, when this connection is in effect, the front panel port 1 is rendered inoperable because the switching functionality of port 1 is redirected for the backplane Channel A connection.

### 1.4.3 Fast Ethernet Channels

The SmartMIM-216 uses the Fast Ethernet Channels FE1, FE2, and FE3 in the Flexible Network Bus (FNB) residing in the MMAC chassis to communicate to one another with the full benefits of the Spanning Tree Algorithm (STA). The channels are 100 Mbps shared Ethernet segments.

When a SmartMIM-216 is installed, it senses if another SmartMIM-216 or 100Mbps module is installed in either or both of the adjacent slots. When an adjacent slot is occupied by a another type module or no module, the FE1, FE2, and FE3 is electronically terminated on that side to isolate the SmartMIM-216 from other type modules in the chassis. However, SmartMIM-216s installed in adjacent slots will communicate with one another, effectively creating a separate Fast Ethernet switching system within the MMAC.

With the Local Management tools, port 15 can be set to pass traffic to FE1 or FE2 and port 16 to FE2 or FE3. However, both ports cannot be set for FE2 at the same time.

### 1.4.4 Full Duplex Switched Ethernet (FDSE)

Each switched Ethernet port supports standard Ethernet communications and can be configured to operate in Full Duplex Switched Ethernet (FDSE) mode. FDSE allows each port to provide a dedicated 20 Mbps bandwidth for file sever or high-end workstation connections. The 100BASE Fast Ethernet ports provide up to 200 Mbps of bandwidth.

### 1.4.5 SmartTrunk

The SmartTrunk feature allows the user to set a group of SmartMIM-216 interfaces via the Local Management tools, so they can share the traffic load and effectively increase the bandwidth between connected SmartMIM-216s or other Cabletron Systems devices supporting the SmartTrunk feature. For example, Ports 15 and 16 could be grouped to provide a 200 Mbps uplink.

### 1.4.6 Runtime IP Address Discovery

Upon power up, the SmartMIM-216, through a function called Runtime IP Address Discovery, sends out RARP and BootP requests over the network to determine its IP address. This function allows the loading of an IP address into NVRAM on the SmartMIM-216 without using Local Management.

### 1.4.7 Management

Management of the SmartMIM-216 is accomplished using SNMP compliant Management tools for in-band management. Out-of-band Local Management is provided through the RJ45 COM port on the front panel using a VT100 terminal or a VT100 terminal emulator. In-band remote management is possible through any SNMP compliant Network Management Software.

Local Management provides the tools necessary to manage the SmartMIM-216 and any of the optional Fast Ethernet Interface Modules installed in ports 15 and 16. Chapter 5 provides detailed information about how to access and use Local Management.

### 1.4.8 Switching

Through Cabletron Systems Synthesis framework, the SmartMIM-216 supports operations in traditional Switching mode or SECUREFAST Switching Virtual Network Services mode between all of the front panel interfaces including the optional ports 15 and 16. With SECUREFAST Switching hardware capability in place in the SmartMIM-216, the future migration to Virtual Network technologies is facilitated without requiring the replacement of existing equipment.

### 1.4.9 Standards Compatibility

The SmartMIM-216 provides IEEE 802.1d Spanning Tree Algorithm (STA) support to enhance the overall reliability of the network and protect against “loop” conditions. The SmartMIM-216 supports a wide variety of industry standard MIBs including RFC 1213 (MIB II), RFC 1757 (RMON), RFC 1371 (RS232 MIB), RFC 1493 (Bridge MIB) and RFC 1354 (FIB MIB). A full suite of Cabletron Systems Enterprise MIBs provide a wide array of statistical information to enhance troubleshooting.

### 1.4.10 LANVIEW Diagnostic LEDs

The various conditions of the LANVIEW diagnostic LEDs serve as important troubleshooting aids. They provide an easy way to observe the transmit and receive status of individual ports and overall network operations such hardware failure, booting, port 1 switching configuration to Channel A, and Fast Ethernet channel usage. Chapter 4 provides details about the SmartMIM-216 LANVIEW LEDs.

## 1.5 OPTIONAL FEATURES

There are three optional Fast Ethernet Interface Modules available from Cabletron Systems to add additional interface capability to the SmartMIM-216.

The optional Fast Ethernet Interface Modules support uplinks to 100 Mbps Ethernet backbones or high speed connections to local servers. The Fast Ethernet Interface Modules are listed in Table 1-1 along with the type connections and application.

**Table 1-1 Fast Ethernet Interface Modules**

| P/N | Connection | Application |
|---|---|---|
| FE-100TX | Uses RJ45 connector | Supports Category 5 Unshielded Twisted Pair (UTP) cabling and Shielded Twisted Pair (STP) cabling. |
| FE-100FX | Uses SC connector | Supports Multimode fiber optic (MMF) cabling. |
| FE-100F3 | Uses SC connector | Supports Single Mode Fiber (SMF) optic cabling. |

## 1.6 DOCUMENT CONVENTIONS

The following conventions are used throughout this document:


**Note** symbol. Calls the reader's attention to any item of information that may be of special importance.


**Tip** symbol. Conveys helpful hints concerning procedures or actions.


**Caution** symbol. Contains information essential to avoid damage to the equipment.

**Electrical Hazard Warning** symbol. Warns against an action that could result in personal injury or death due to an electrical hazard.

## 1.7 GETTING HELP

If you need additional support for this device, or if you have any questions, comments, or suggestions concerning this manual, contact Cabletron Systems Technical Support:

| | |
|---|---|
| Phone | (603) 332-9400<br>Monday – Friday; 8 A.M. – 8 P.M. Eastern Time |
| CompuServe | GO CTRON from any ! prompt |
| Internet mail | support@ctron.com |
| FTP<br>Login<br>Password | ctron.com (134.141.197.25)<br>*anonymous*<br>*your email address* |
| BBS<br>Modem setting | (603) 335-3358<br>8N1: 8 data bits, No parity, 1 stop bit |
| For additional information about Cabletron Systems products, visit our World Wide Web site: http://www.cabletron.com/ | |

Before calling Cabletron Systems Technical Support, be prepared to provide the following information:

- A description of the failure
- A description of any action(s) already taken to resolve the problem (e.g., changing mode switches, rebooting the unit, etc.)
- A description of your network environment (layout, cable type, etc.)
- Network load and frame size at the time of trouble (if known)
- The serial and revision numbers of all Cabletron products in the SmartMIM-216 network
- The device history (i.e., have you returned the device before, is this a recurring problem, etc.)
- Any previous Return Materials Authorization (RMA) numbers

## 1.8 RELATED MANUALS

The following manuals may help the user to control and manage the SmartMIM-216 using SNMP network management systems:

Cabletron Systems *SPECTRUM Element Manager for Windows*

Cabletron Systems *SPECTRUM and SPECTRUM Portable Management Applications* (SPMA) products

Third Party SNMP compliant Network Management Packages

Cabletron Systems *Ethernet Technology Guide*

Cabletron Systems *Networking Cabling Guide*

The manuals referenced above can be obtained from the World Wide Web in Adobe Acrobat Portable Document Format (PDF) at the following site:

http://www.cabletron.com/

These manuals are also available on the Cabletron Systems Hardware Manuals CD-ROM.

# CHAPTER 2
# NETWORK REQUIREMENTS

This chapter contains networking guidelines. Before attempting to use the SmartMIM-216 or to install a Fast Ethernet Interface Module (FE-100TX, FE-100FX, or FE-100F3), review the requirements and specifications outlined in this chapter concerning the following:

- SmartTrunk (Section 2.1)
- 10BASE-T Twisted Pair Network (Section 2.2)
- 100BASE-TX Twisted Pair Network (Section 2.3)
- 100BASE-FX Fiber Optic Network (Section 2.4)

The network installation must meet the guidelines included in this chapter to ensure the satisfactory performance of this equipment. Failure to follow these guidelines may produce poor network performance.

Refer to the following sections that apply to your specific network configuration.

## 2.1 SmartTrunk

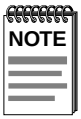
To connect the SmartMIM-216 into a network so it can take advantage of the SmartTrunk feature, there are certain rules concerning port connections and configurations that must be followed for proper operation. Section 5.20 in Chapter 5 describes SmartTrunking and provides the configuration rules.

## 2.2 10BASE-T TWISTED PAIR NETWORK

When connecting a 10BASE-T twisted pair segment to any of the SmartMIM-216 ports (Interfaces 1 through 14), ensure that the network meets the following requirements:

### Length

The IEEE 802.3 standard for 10BASE-T requires that 10BASE-T devices transmit over a 100 meter (328 foot) link using 22–24 AWG Unshielded Twisted Pair (UTP) wire. However, cable quality largely determines the maximum link length. If high quality, low attenuation cable, is used, link lengths of up to 200 meters can be achieved. Cable delay limits the maximum link length to 200 meters.




Losses introduced by connections at punch-down blocks and other equipment reduce total segment length. For each connector or patch panel in the link, subtract 12 meters from the total length of the cable.

### Impedance

Cabletron Systems 10BASE-T twisted pair products work on twisted pair cable with 75 to 165 ohms impedance. UTP cables typically have an impedance from 85 to 110 ohms. Shielded twisted pair cables, such as IBM Type 1 cable with an impedance of 150 ohms may also be used.

### Temperature

Multi-pair PVC 24 AWG telephone cables typically have an attenuation of approximately 8 to 10 dB/100 m at 20°C (68°F). The attenuation of PVC insulated cable varies significantly with temperature. At temperatures greater than 40°C (104°F), use plenum-rated cable to ensure that the attenuation remains within specification.

## 2.3 100BASE-TX TWISTED PAIR NETWORK

The SmartMIM-216 with an FE-100TX installed in ports 15 and 16 provides an RJ45 connection that supports UTP cabling. The device at the other end of the twisted pair segment must meet IEEE 802.3u 100BASE-TX specifications for the devices to operate at 100 Mbps. Use Category 5 UTP cabling for networks operating at 100 Mbps. Use Category 3, 4, or 5 UTP cabling for networks operating at 10 Mbps.


The SmartMIM-216 with an FE-100TX installed is capable of operating at either 10 or 100 Mbps. The FE-100TX can automatically sense the speed of the other device and adjusts its speed accordingly.

When connecting a 100BASE-TX twisted pair segment to port 15 and 16 with an FE-100TX interface module, the network must meet the following requirements:

### Length

The IEEE 802.3u standard for 100BASE-TX requires that 100BASE-TX devices must be capable of transmitting over a 100 meter (328 foot) link using Category 5 UTP cable.

The IEEE 802.3 standard for 10BASE-T requires that 10BASE-T devices must be capable of transmitting over a 100 meter (328 foot) link using Category 3, 4, or 5 UTP cable.

### Propagation Delay

Propagation delay is the amount of time it takes data to travel from the sending device to the receiving device.

Total propagation delay allowed for a 100BASE-TX (100 Mbps) network is 256 bit times or 2.56 microseconds (2.56 µs) in one direction (5.12 µs round trip). If the total propagation delay between any two nodes on a 100BASE-TX network exceeds 2.56 µs, then use bridges or other devices to further segment the network.

Total propagation delay allowed for a 10BASE-T (10 Mbps) network is 256 bit times or 25.6 µs in one direction. If the total propagation delay between any two nodes on a 10BASE-T network exceeds 25.6 µs, then use bridges or other devices to further segment the network.

### Temperature

The attenuation of PVC insulated cable varies significantly with temperature. At temperatures greater than 40°C (104°F), use plenum rated cables to ensure that cable attenuation remains within specification.

## 2.4 100BASE-FX FIBER OPTIC NETWORK

Ports 15 and 16 of the SmartMIM-216 support the Cabletron Systems FE-100FX and FE-100F3 fiber optic interface modules. The FE-100FX and FE-100F3 meet the IEEE 802.3u standard. When connecting a fiber optic segment to the SmartMIM-216, the network must meet the following requirements:

### Cable Loss

The maximum acceptable loss for a multimode cable is 11.0 dB. Test the multimode fiber optic cable with a fiber optic attenuation test set adjusted for an 850 nm wavelength. This test is to verify that the signal loss is within the acceptable level of 11.0 dB.

The maximum acceptable loss for a single mode cable is 10.0 dB. Test the multimode fiber optic cable with a fiber optic attenuation test set adjusted for a 1300 nm wavelength. This test is to verify that the signal loss is within the acceptable level if 10.0 dB.

### Multimode Fiber Cable Lengths

The maximum length of a 100BASE-FX segment may be no more than 412 meters between Data Terminal Equipment (DTE to DTE) in half duplex mode or 2 km (DTE to DTE) in full duplex mode.

### Single Mode Fiber Cable Lengths

The maximum length of a 100BASE-FX segment may be no more than 5 km between Data Terminal Equipment (DTE to DTE) in half duplex mode or 20 km (DTE to DTE) in full duplex mode.

### Attenuation

Test the fiber optic cable with a fiber optic attenuation test set adjusted for an 850 nm wavelength. This test verifies that the signal loss is within an acceptable level. The maximum loss for a multimode cable is 11.0 dB.

### Fiber Optic Budget and Propagation Delay

Determine the maximum fiber optic cable length by calculating the fiber optic budget delay and total network propagation before fiber optic cable runs are incorporated in any network design.

Fiber optic budget is the combination of the optical loss due to the fiber optic cable, in-line splices, and fiber optic connectors.

Propagation delay (collision delay) is the amount of time it takes data to travel from the sending device to the receiving device. Total propagation delay allowed for the entire network is 256 bit times (2.56 µs) in one direction. If the total propagation delay between any two nodes on the network exceeds 2.56 µs, then use bridges or other devices to further segment the network.

# CHAPTER 3
# INSTALLATION

This chapter contains the following information necessary to install the SmartMIM-216:

- Unpacking the SmartMIM-216 (Section 3.1)
- Setting the mode switches (Section 3.2)
- Installation considerations (Section 3.3)
- Installation (Section 3.4)
- Connecting to the network (Section 3.5)
- Completing the installation (Section 3.6)

## 3.1 UNPACKING THE SmartMIM-216

Unpack the SmartMIM-216 as follows:


Observe all antistatic precautions when handling static sensitive electronic equipment.

1. Open the box and remove the packing material protecting the SmartMIM-216.
2. Verify the contents of the carton as listed in Table 3-1.

**Table 3-1 Contents of SmartMIM-216 Carton**

| Item | Quantity |
|---|---|
| SmartMIM-216 | 1 |
| Disk set containing firmware image | 1 |
| Antistatic Wrist Strap | 1 |
| RJ45 Adapter Kit | 1 |
| Release Notes | 1 |

3. Remove the SmartMIM-216 from the box. Leave the module inside the non-conductive bag until just prior to installation.


Failure to observe static safety precautions could cause damage to theSmartMIM-216. Follow static safety handling rules and properly wear the antistatic wrist strap provided.


Do not cut the non-conductive bag to remove the module. Damage could result from sharp objects contacting the board or components.

4. Remove the black and yellow tape seal on the non-conductive bag to remove the SmartMIM-216.
5. Perform a visual inspection of the module for any signs of physical damage and contact Cabletron Systems Technical Support if there are any signs of damage.

## 3.2 SETTING THE MODE SWITCHES

Figure 3-1 shows the location of the mode switches and the switch settings for normal operation. These switches are set at the factory and do not need to be changed.


Never adjust switch settings while the SmartMIM-216 is on. The change in position only activates the switch function after cycling power to the board or pressing the RESET button.

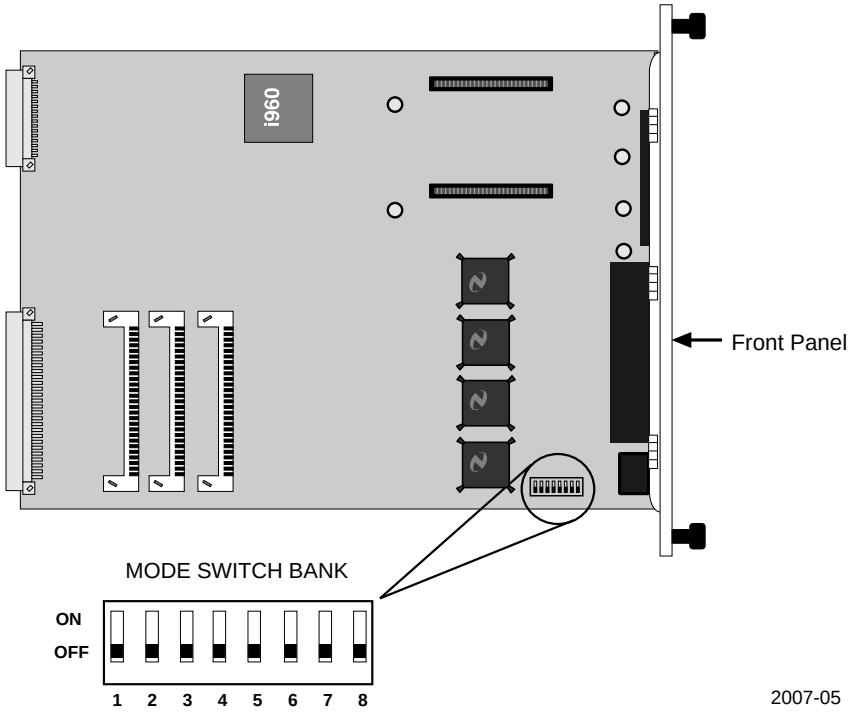
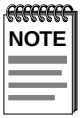



**Figure 3-1 SmartMIM-216 Mode Switches**

The following switch definitions are provided for future reference if necessary:

- Switches 1 through 5. Cabletron Systems use only.




The functions of Switches 6, 7, and 8 are only activated after the switch position is changed and power to the SmartMIM-216 is cycled.

- Switch 6: Forced Download. Do NOT attempt a Forced Download unless a BootP server has been configured for the SmartMIM-216. The BootP server references the location of a station acting as a Trivial File Transfer Protocol (TFTP) server containing the SmartMIM-216 image file. When the position of Switch 6 is changed and the power is cycled to the SmartMIM-216, the device requests the image file location from the BootP server and uses TFTP to download the image from the TFTP server. If one of these requirements is not met, the SmartMIM-216 will continue to request either the BootP server or TFTP server until the RESET button on the SmartMIM-216 is pressed. Once the RESET button is pressed, the SmartMIM-216 will reset after one minute and load the image stored in FLASH memory.

- Switch 7: NVRAM Reset. Changing the position of the switch resets NVRAM on either the next power-up or the next operation of the front panel RESET button. All user-entered parameters, such as IP addresses, device names, etc., are reset to the factory default settings. Changing the state of this switch (i.e., moving the switch from one position to another) and cycling power to the SmartMIM-216 resets these parameters to the factory defaults. Once the SmartMIM-216 NVRAM resets, you can either use the factory defaults or re-enter your own parameters.
- Switch 8: Password Defaults. Changing the position of the switch resets passwords to the factory default settings on either the next power-up or the next operation of the front panel RESET button. All user-entered passwords are reset to the factory default settings.Once the SmartMIM-216 resets, you can either use the factory defaults or re-enter your own passwords.

## 3.3 INSTALLATION CONSIDERATIONS

Before installing the SmartMIM-216 in an MMAC hub consider the configuration of the modules within the hub. The location of the different modules in the hub can affect communication between MIMs and the ability to manage MIMs. When configuring various Cabletron Systems hubs, remember the following:

- MMAC-3FNB board slot numbers increment from bottom to top. MMAC-5FNB, MMAC-8FNB, and MMAC-M8FNB board slot numbers increment from right to left.
- The first slot in every MMAC is a narrow slot reserved for a management module. The management module can be either a half-width module, such as the TRMM, IRM-3 or EMME or it can be a double-width module, such as the EMM-E6. Do not place full-width modules in the first slot of an MMAC. When not using either a half-width management module or a double-width module, leave the first slot empty.
- Ethernet modules that use Channels “B” and “C” in the MMAC must be to the right of any SmartMIM-216s.
- When using the SmartTrunk feature, the SmartMIM-216 will only recognize Cabletron Systems modules that are installed in adjacent slots and support SmartTrunking

Figure 3-2 shows an example of a chassis configured with an EMM-E6 occupying the first two slots; three SmartMIM-216s in slots 4, 5, and 6; an FDMMIM in slot 7; and an FDCMIM-04 in slot 8.

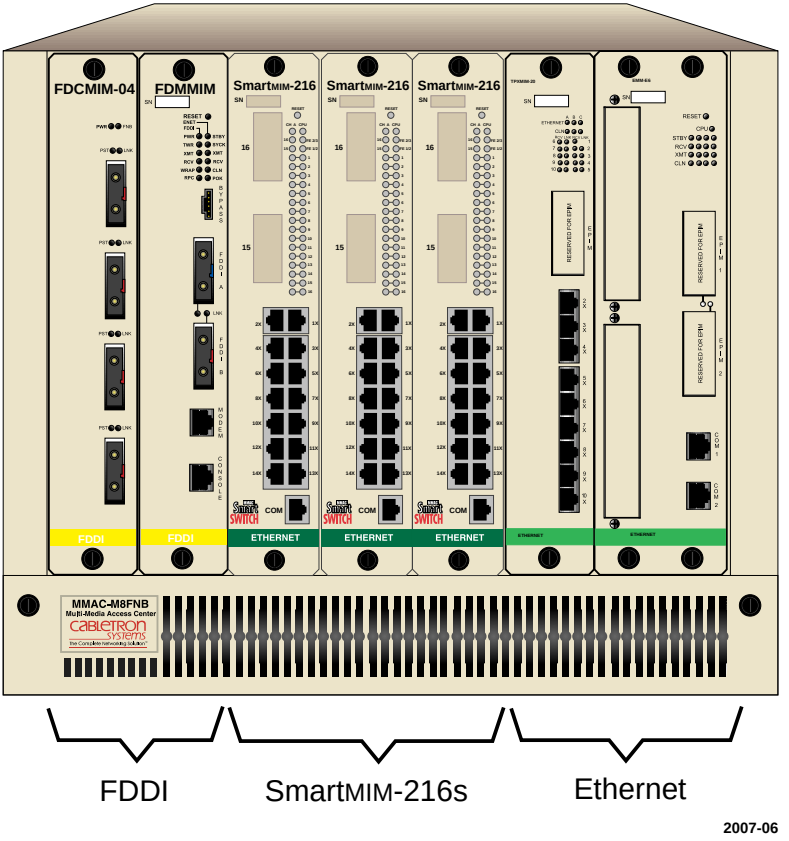



**Figure 3-2 Sample Chassis Configuration**

## 3.4 INSTALLATION

Installing the SmartMIM-216 into any MMAC hub is an easy operation and requires no special tools. When installing the device, observe the Cautions provided for the installer.

ONLY QUALIFIED PERSONNEL SHOULD PERFORM THESE INSTALLATION PROCEDURES.


Observe all antistatic precautions when handling static sensitive electronic equipment.

Install the SmartMIM-216 into the MMAC-FNB (backplane) as follows:


We recommend powering down the MMAC hub prior to inserting or removing modules, even though Cabletron Systems modules have “hot swap” capabilities.

1. Remove the security bars that protect the chassis (MMAC-M5FNB and MMAC-M8FNB only) and remove any module to be replaced or blank slot covers, in accordance with the installation and removal procedures for these items.
2. While holding the SmartMIM-216 by the front panel, or by the edges of the board, align the bottom and top edges of the printed circuit board with the guides. Make sure that both the bottom and top edges of the printed circuit board rest in these guides. See Figure 3-3.
3. Slide the SmartMIM-216 into slots of the MMAC chassis as shown in Figure 3-3.


Forcing a misaligned module into place can damage the SmartMIM-216 or the MMAC backplane.

4. Firmly press the module connections into the backplane. Do not try to force the module into place or use the knurled knobs to draw the module into the backplane.

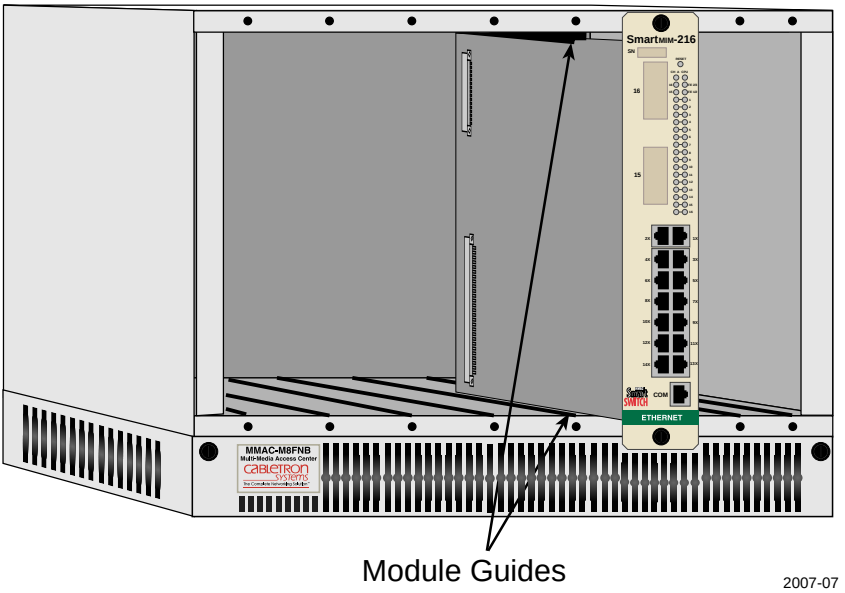



**Figure 3-3 Installing the SmartMIM-216**

5. Secure the module to the MMAC chassis by hand tightening the knurled knobs. If you do not tighten the knurled knobs, vibration can cause the module to lose contact with the backplane and disrupt the network.
6. Reinstall the MMAC chassis security bars (MMAC-M5FNB and MMAC-M8FNB only).
7. Power-up the MMAC (if it is not already on).

8. Observe the status of the LANVIEW LEDs (Figure 3-4) on the SmartMIM-216. When the CPU LED is blinking amber, the module is in boot state. During this time (approximately one minute), the SmartMIM-216 cycles through a series of internal diagnostics.

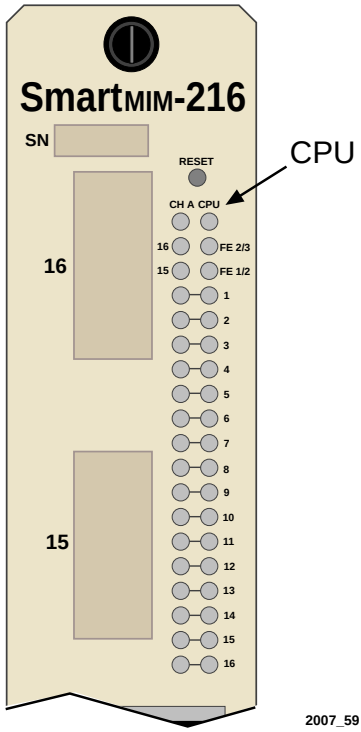


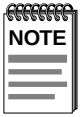

**Figure 3-4 CPU LED**

9. After the system boot procedure, the CPU LED should be blinking green, indicating proper operation. If the CPU LED is not blinking green, refer to Chapter 4, **Troubleshooting**.

Proceed to Section 3.5, **Connecting to the Network**, to connect the appropriate network segments to the SmartMIM-216.

## 3.5 CONNECTING TO THE NETWORK

This section provides the procedures for connecting twisted pair and fiber optic segments from the network or other devices to the SmartMIM-216.




If the SmartMIM-216 is being installed in a network using SmartTrunking, there are rules concerning the network cable and port configurations that must be followed for SmartTrunking to operate properly. Before connecting the cables, refer to Section 5.20, **SmartTrunk Configuration**, for the configuration information.

Ports 1 through 14 on the SmartMIM-216 have RJ45 connectors for twisted pair connections. Ports 15 and 16 support FE-100TX, FE-100FX or FE-100F3 Fast Ethernet Interface Modules. The FE-100TX has an RJ45 connector for a UTP cable connection. The FE-100FX and FE-100F3 have SC connectors for fiber optic cable connections.

Refer to Section 3.5.1 to make UTP connections to Ports 1 through 14.

Refer to Section 3.5.2 to make a UTP connection to an FE-100TX in port slot 15 or 16.

Refer to Section 3.5.3 to make a fiber optic cable connection to an FE-100FX or FE-100F3 in port slot 15 or 16.

### 3.5.1 Connecting UTP Cables to Ports 1 Through 14

Ports 1 through 14 of the SmartMIM-216 are 10BASE-T ports with internal crossovers. When connecting a workstation, use a straight-through cable. When connecting networking devices, such as another bridge, repeater, or router, use a crossover cable.

Connect a twisted pair segment to the SmartMIM-216 as follows:

1. Ensure that the device connected to the other end of the segment is powered up
2. Connect the twisted pair segment to the SmartMIM-216 by inserting the RJ45 connector on the twisted pair segment into the desired RJ45 port (Ports 1 through 14) as shown in Figure 3-5.

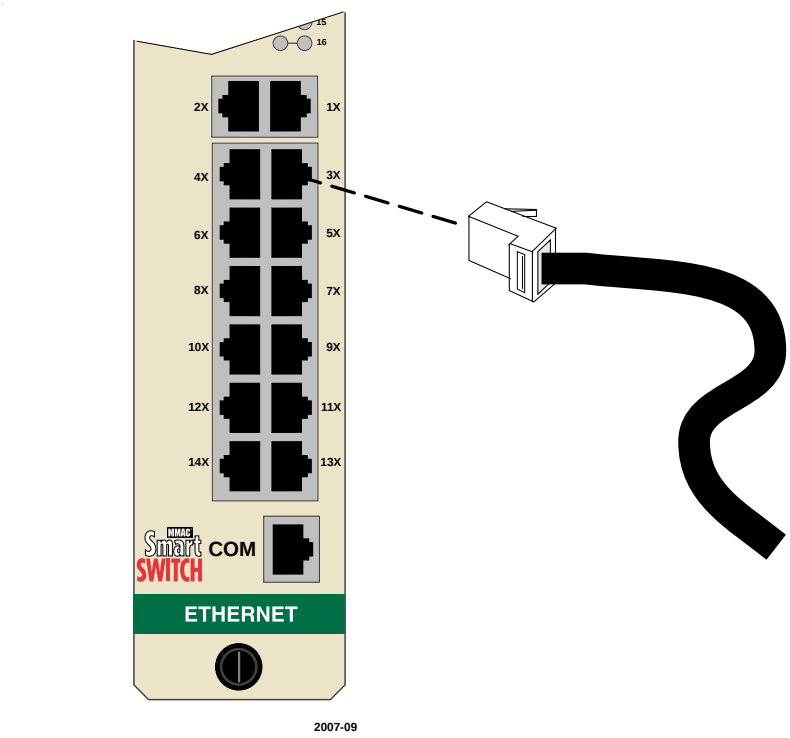



**Figure 3-5 SmartMIM-216 Twisted Pair Connection**

3. Verify that a Link exists by checking that the associated port **RX** LED is on (flashing amber or on solid green). If the **RX** LED is off and the **TX** LED is not blinking Amber, perform the following steps until it is on:

   a. Verify that the 10BASE-T device at the other end of the twisted pair segment is operating and connected to the segment.

   b. Verify that the RJ45 connectors on the twisted pair segment have the proper pinouts (Figure 3-6) and check the cable for continuity.

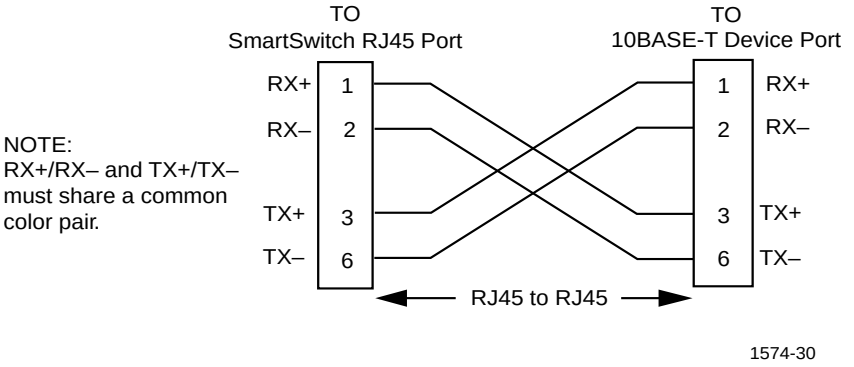



**Figure 3-6 Cable Pinouts - (RJ45) Crossover Cable**

c. Check that the twisted pair connection meets the dB loss and cable specifications outlined in Chapter 2.

If a link is not established, contact Cabletron Systems Technical Support. Refer to Section 1.7, **Getting Help**, for details.

4. Repeat steps 1 through 3, above, until all connections have been made.

### 3.5.2 Connecting a UTP Segment to the FE-100TX

An FE-100TX installed in port slot 15 and 16 has an internal crossover switch. When connecting a workstation, use a straight-through cable and set the Fast Ethernet Interface Module crossover switch shown in Figure 3-7 to the crossed over position marked with an X. When connecting networking devices, such as another bridge, repeater, or router, use a straight-through cable and set the Fast Ethernet Interface Module crossover switch, shown in Figure 3-7, to not crossed over position marked with =.

A schematic of a crossover cable is shown in Figure 3-6. If the wires do not cross over, use the switch on the FE-100TX to internally cross over the RJ45 port. Figure 3-7 shows how to properly set the FE-100TX crossover switch.

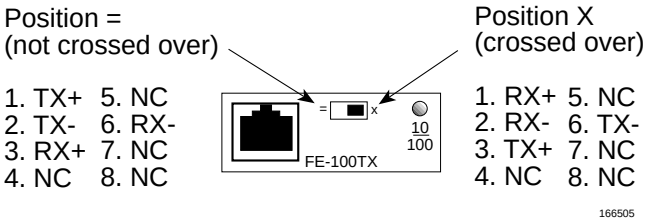



**Figure 3-7 FE-100TX Crossover Switch**

Connect an FE-100TX to a twisted pair segment as follows:

1. Ensure that the device connected to the other end of the segment is powered up.
2. Connect the twisted pair segment to the module by inserting the RJ45 connector on the twisted pair segment into the RJ45 port on the module shown in Figure 3-7.

3. Verify that a Link exists by checking that the port **RX** LED is on (flashing amber or on solid green). If the **RX** LED is off and the **TX** LED is not blinking Amber, perform the following steps until it is on:

   a. Check that the 100BASE-TX device at the other end of the twisted pair segment is powered up.

   b. Verify that the RJ45 connector on the twisted pair segment has the proper pinouts.

   c. Confirm that the crossover switch is in the correct position.

   d. Check the cable for continuity.

   e. Make sure that the twisted pair connection meets the cable specifications outlined in Section 2.3.

If a Link is not established, contact Cabletron Systems Technical Support. Refer to Section 1.7, **Getting Help**, for details.

### 3.5.3 Connecting a Fiber Optic Segment to the FE-100FX and FE-100F3

The FE-100FX and FE-100F3 have SC style network ports (see Figure 3-8). Cabletron Systems recommends using fiber optic cables that are keyed to ensure proper crossover of the transmit and receive fibers.


An odd number of crossovers (preferably one) must be maintained between devices so that the transmit port of one device is connected to the receive port of the other device and vice versa.

If the fiber optic cable being used has SC style connectors that do not resemble MIC style connectors, or has SC connectors on one end and a different type on the other, such as ST connectors, ensure that the proper crossing over occurs.

### Fiber Optic Network Connection


The FE-100F3 uses Class 1 lasers. Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.

1. Remove the protective plastic covers from the fiber optic ports on the applicable port on the module and from the ends of the connectors.


Do not touch the ends of the fiber optic strands, and do not let the ends come in contact with dust, dirt, or other contaminants. Contamination of the ends causes problems in data transmissions. If the ends become contaminated, clean them with alcohol using a soft, clean, lint-free cloth.

2. Insert one end of the SC connector into the FE-100FX or FE-100F3 installed in the SmartMIM-216. See Figure 3-8.
3. At the other end of the fiber optic cable, attach the SC connector to the other device.

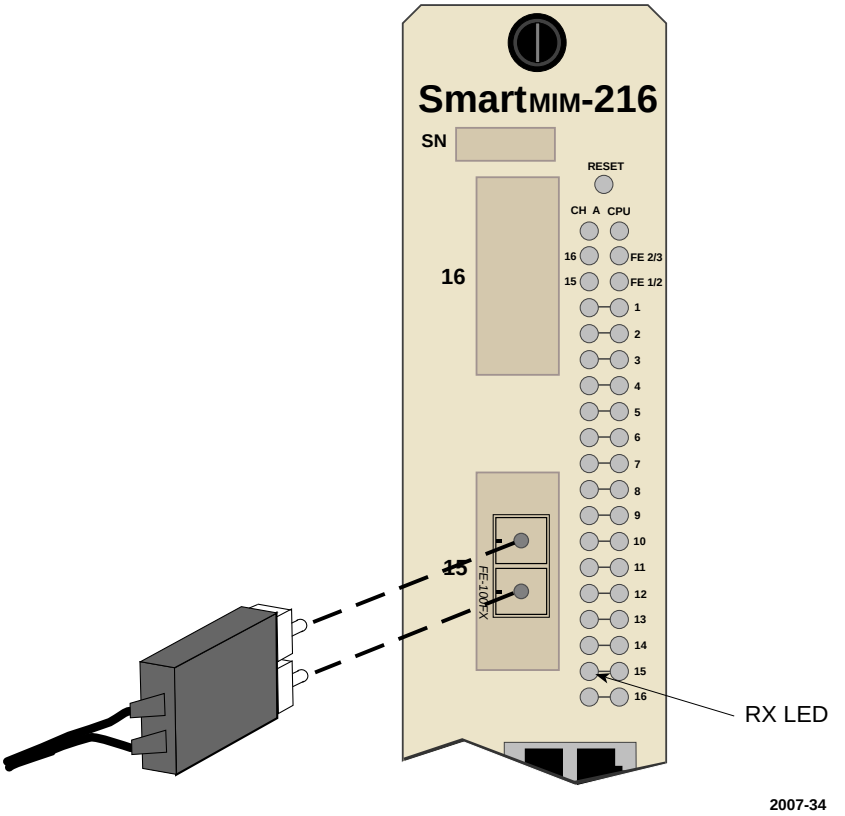



**Figure 3-8 FE-100FX and FE-100F3 Ports**

4. Verify that a Link exists by checking that the port **RX** LED is on (flashing amber, or on solid green). If the **RX** LED is off and the **TX** LED is not blinking Amber, perform the following steps until it is on:

    a. Check that the power is turned on for the device at the other end of the Link.

    b. Verify proper crossover of fiber strands between the applicable port on the SmartMIM-216 and the fiber optic device at the other end of the fiber optic link segment.

    c. Verify that the fiber connection meets the dB loss specifications outlined in Chapter 2.

If a Link has not been established, contact Cabletron Systems Technical Support. Refer to Section 1.7, **Getting Help**, for details.

## 3.6 COMPLETING THE INSTALLATION

After installing the SmartMIM-216 and any optional Fast Ethernet Interface Modules as appropriate, and making the connections to the network, the SmartMIM-216 is now ready to be set up through Local Management. Refer to Chapter 5, **Local Management**, for information on how to access and use Local Management to configure the SmartMIM-216.

# CHAPTER 4
# TROUBLESHOOTING

This chapter provides information concerning the following:

- Smarting-216 LANVIEW LEDs (Section 4.1)
- FE-100TX 10/100 LED indications (Section 4.2)
- Troubleshooting check list (Section 4.3)
- Using the RESET button (Section 4.4)

## 4.1 SmartMIM-216 LANVIEW LEDS

The SmartMIM-216 uses Cabletron Systems built-in visual diagnostic and status monitoring system, LANVIEW. The LANVIEW LEDs (Figure 4-1) allow quick observation of the network status to aid in diagnosing network problems. Table 4-1 describes the LED indications.

For a functional description of the LANVIEW LED on the optional Fast Ethernet Interface Module (FE-100TX), refer to Section 4.2.

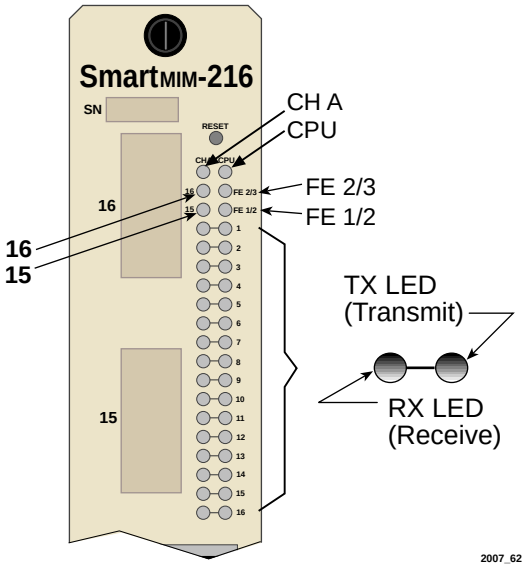
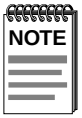



**Figure 4-1 LANVIEW LEDs**




The terms **flashing**, **blinking**, and **solid** used in the following tables indicate the following:

**Flashing** indicates an irregular LED pulse.

**Blinking** indicates a steady LED pulse.

**Solid** indicates a steady LED light. No pulsing.

**Table 4-1 LANVIEW LEDs**

| LED | Color | State | Recommended Action |
|---|---|---|---|
| CPU | Off | Power off. | Power up chassis. |
| | Red | **Flashing**. Hardware failure has occurred. | Contact Cabletron Systems Technical Support. |
| | | **Solid**. Reset, normal power up reset. | No action. |
| | Amber | **Solid**. Testing. | No action. |
| | Green | **Blinking**. Functional. | No action. |
| | Amber | **Blinking**. System is booting. | No action. |
| CH A (Channel A) | Off | Port 1 configured for front panel. | No error. |
| | Green | Port 1 configured to the ”A” channel backplane. | No error. |
| FE 2/3 (Fast Ethernet) | Both Off | Port 16 configured to front panel. | No error. |
| | 2 Green | Port 16 configured to FE Channel 2. | No error. |
| | 3 Green | Port 16 configured to FE Channel 3. | No error. |

**Table 4-1 LANVIEW LEDs (Continued)**

| LED | Color | State | Recommended Action |
|---|---|---|---|
| FE 1/2 (Fast Ethernet) | Both Off | Port 15 configured to front panel. | No error. |
| | 1 Green | Port 15 configured to FE Channel 1. | No error. |
| | 2 Green | Port 15 configured to FE Channel 2. | No error. |
| RX (Receive) | Off | Port in standby if amber TX LED is blinking, or no link. | No error. |
| | Green | **Solid**. Port enabled, link, no activity. | No error. |
| | | **Blinking**. Port disabled, link. | No error. |
| | Amber | **Flashing**. Indicates receive activity. | No error. |
| TX (Transmit) | Off | Port enabled and no activity. | Should flash green every two seconds indicating BPDUs being sent if STA is enabled and there is a valid link. |
| | Green | **Flashing**. Indicates activity. Rate indicates data rate. | No action. |
| | Amber | **Blinking**. Port in standby. | Port may be disabled due to Spanning Tree. |
| | Red | **Flashing**. Indicates collision rate. | No action. |
| | | **Solid** indicates numerous collisions and indicates a problem. | Contact Cabletron Systems Technical Support for assistance. |

## 4.2 FE-100TX 10/100 LED INDICATIONS

The optional FE-100TX has one LED labeled 10/100. The 10/100 LED together with the associated port (15 or 16) Receive (RX) LED allows the user to determine the Link status and the operating speed of the Fast Ethernet Interface Module. Figure 4-2 shows an FE-100TX installed in port 16 and the location of the associated RX (Receive) LED for port 16. Table 4-2 and Table 4-3 describe what the condition of the 10/100 LED indicates depending on the condition of the RX LED.

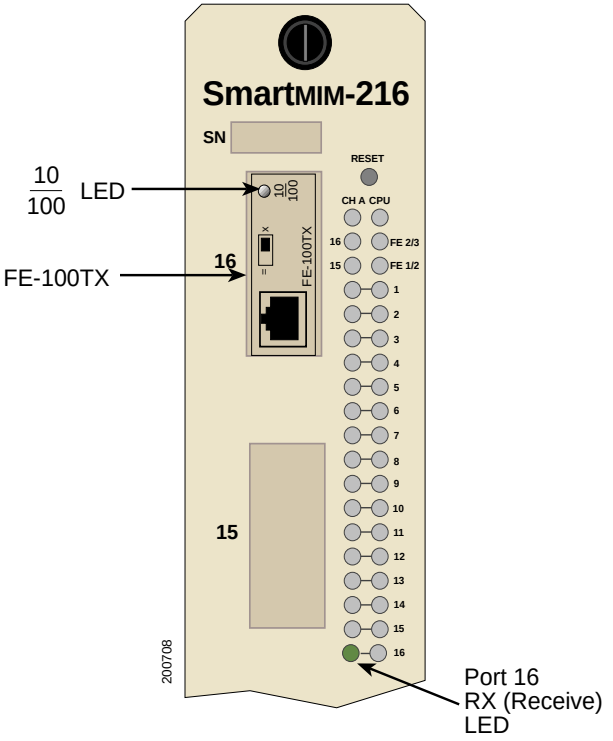



**Figure 4-2 FE-100TX 10/100 LED**


A Link exists if the associated port (15 or 16) RX (Receive) LED is flashing amber, blinking green, or solid green.

When port 15 or 16 is connected to the backplane, that port is always operating at 100 Mbps.

**Table 4-2 FE-100TX 10/100 LED Indications (With Link)**

| LED | Color | Indication |
|---|---|---|
| 10/100 | Off | FE-100TX is operating at 10 Mbps. |
| | Green | FE-100TX is operating at 100 Mbps. |


No Link exists if the associated port (15 or 16) RX (Receive) LED is OFF.

**Table 4-3 FE-100TX 10/100 LED Indications (Without Link)**

| LED | Color | Indication |
|---|---|---|
| 10/100 | Off | No Link or no cable attached. FE-100TX is forced to 10 Mbps operation, or is manually set to “auto-negotiation” mode. |
| | Green | No Link or no cable attached. FE-100TX is forced to 100 Mbps operation. |

## 4.3 TROUBLESHOOTING CHECKLIST

If the SmartMIM-216 is not working properly, refer to Table 4-4 for a checklist of common problems, possible causes, and recommended actions to resolve the problem.

**Table 4-4 Troubleshooting Checklist**

| Problem | Possible Cause | Recommended Action |
|---|---|---|
| All LEDs are OFF | Loss of power. | Check the proper connection of the chassis power cable and its access to a live outlet. |
| | Installed improperly. | Check the installation. |
| No Local Management Password screen. | Autobaud is enabled. | Press ENTER (RETURN) (may take up to four times). |
| | Terminal setup is not correct. | Refer to Chapter 5 for proper setup procedures. |
| | Improper console cable used. | Refer to Appendix A for proper console port pinouts. |
| Cannot contact the SmartMIM-216 from in-band management. | Improper Community Names Table. | Refer to Chapter 5 for Community Names Table setup. |
| | IP address not assigned. | Refer to Chapter 5 for IP address assignment procedure. |
| | Port is disabled. | Enable port. |
| | No link to device. | Check link to device. |
| Port(s) goes into standby for no apparent reason. | Looped detected. | Review network design and delete unnecessary loops. |

## 4.4 USING THE RESET BUTTON

The RESET button shown in Figure 4-3 resets the SmartMIM-216 processor without affecting the NVRAM.

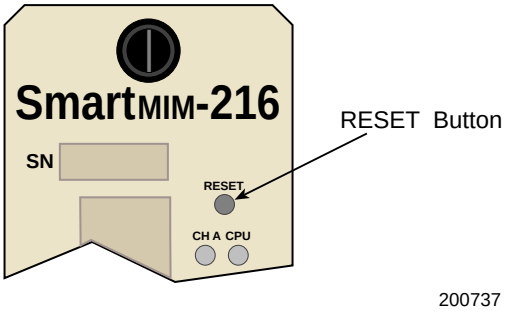



**Figure 4-3 RESET Button**

To reset the SmartMIM-216 processor, use a pen or pencil to press and release the RESET button. The SmartMIM-216 goes through a reset process for approximately 45 seconds.

# CHAPTER 5
# LOCAL MANAGEMENT

This chapter explains how to set up a management terminal to access Local Management. It also explains how to use the Local Management screens and commands.

## 5.1 OVERVIEW

Local Management for the SmartMIM-216 consists of a series of management screens that allow the management of the SmartMIM-216 and its attached segments. The management screens allow the user to do the following tasks:

- Assign IP addresses and subnet masks
- Select a default gateway and subnet mask
- Control access by establishing community names
- Clear NVRAM
- Force a FLASH Download
- Designate which Network Management Workstations receive SNMP traps from the device
- View statistics
- Configure ports
- Control the number of receive broadcasts that are bridged out to the other interfaces

There are three ways to access Local Management:

- Locally using a VT type terminal connected to the COM port
- Remotely using a VT type terminal connected through a modem
- In-band through a TELNET connection

## 5.2 LOCAL MANAGEMENT KEYBOARD CONVENTIONS

All key names are shown as capital letters in this manual. Table 5-1 explains the keyboard conventions used in this guide and describes the key functions that are used.

**Table 5-1 Keyboard Conventions**

| Key | Function |
|---|---|
| ENTER Key<br>RETURN Key | These are selection keys that perform the same Local Management function. For example, “Press ENTER” means that you can press either ENTER or RETURN, unless this manual specifically instructs you otherwise. |
| ESCAPE (ESC) Key | This key allows an escape from a Local Management screen without saving changes. For example, “Press ESC twice” means the ESC key must be pressed quickly two times. |
| SPACE Bar<br>BACKSPACE Key | These keys cycle through selections in some Local Management fields. Use the SPACE bar to cycle forward through selections and use BACKSPACE to cycle backward through selections. |
| Arrow Keys | These are navigation keys. Use the UP-ARROW, DOWN-ARROW, LEFT-ARROW, and RIGHT-ARROW keys to move the screen cursor. For example, “Use the arrow keys” means to press whichever arrow key moves the cursor to the desired field on the Local Management screen. |
| [–] Key | This key decreases values from a Local Management increment field. For example, “Press [–]” means to press the minus sign key. |
| DEL Key | The DEL (Delete) key removes characters from a Local Management field. For example, “Press DEL” means to press the Delete key. |

## 5.3 MANAGEMENT TERMINAL SETUP

Use one of the following systems to access Local Management:

- An IBM or compatible PC running a VT series emulation software package
- A Digital Equipment Corporation VT100 type terminal
- A VT type terminal running emulation programs for the Digital Equipment Corporation VT100 series
- A remote VT100 type terminal via a Hayes compatible modem connection
- In-band via a TELNET connection

### 5.3.1 Console Cable Connection

Use the Console Cable Kit provided with the SmartMIM-216 to attach the management terminal to the SmartMIM-216 COM port as shown in Figure 5-1.

Connect an IBM PC or compatible device, running the VT terminal emulation, to the SmartMIM-216 as follows:

1. Connect the RJ45 connector at one end of the cable (supplied in the kit) to the COM port on the SmartMIM-216.
2. Plug the RJ45 connector at the other end of the cable into the RJ45-to-DB9 adapter (supplied in the kit).
3. Connect the RJ45-to-DB9 adapter to the communications port on the PC.

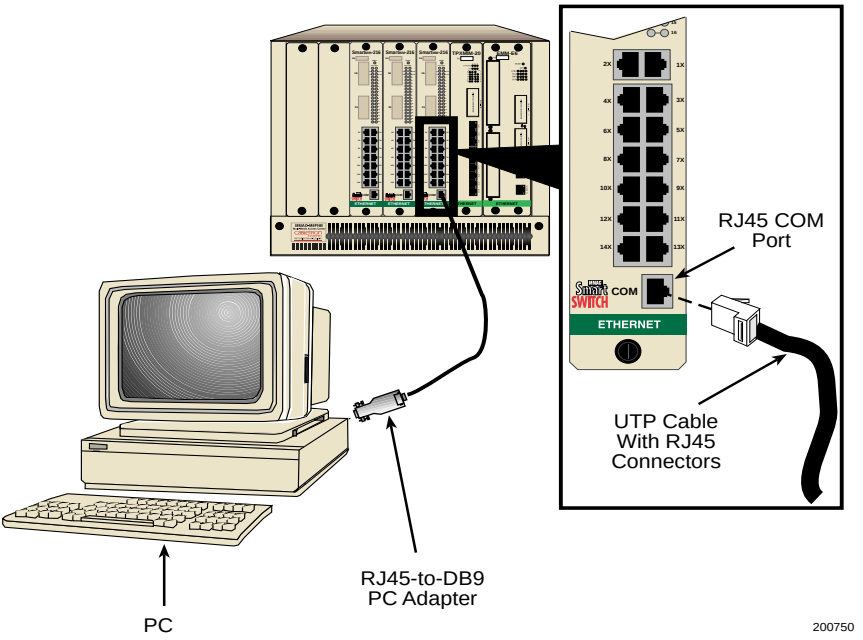



**Figure 5-1 Management Terminal Connection**

### 5.3.2 Connecting an Uninterruptible Power Supply (UPS)

Use the Console Cable Kit provided with the SmartMIM-216 to attach the UPS to the SmartMIM-216 COM port as shown in Figure 5-2.

Connect the UPS device to the COM port of the SmartMIM-216 as follows:

1. Connect the RJ45 connector at one end of the cable to the COM port on the SmartMIM-216.
2. Plug the RJ45 connector at the other end of the cable into the RJ45-to-DB9 male (UPS) adapter.
3. Connect the RJ45-to-DB9 male (UPS) adapter to the female DB9 port on the rear of the UPS device (see the particular UPS device's user instructions for more specific information about the monitoring connection).

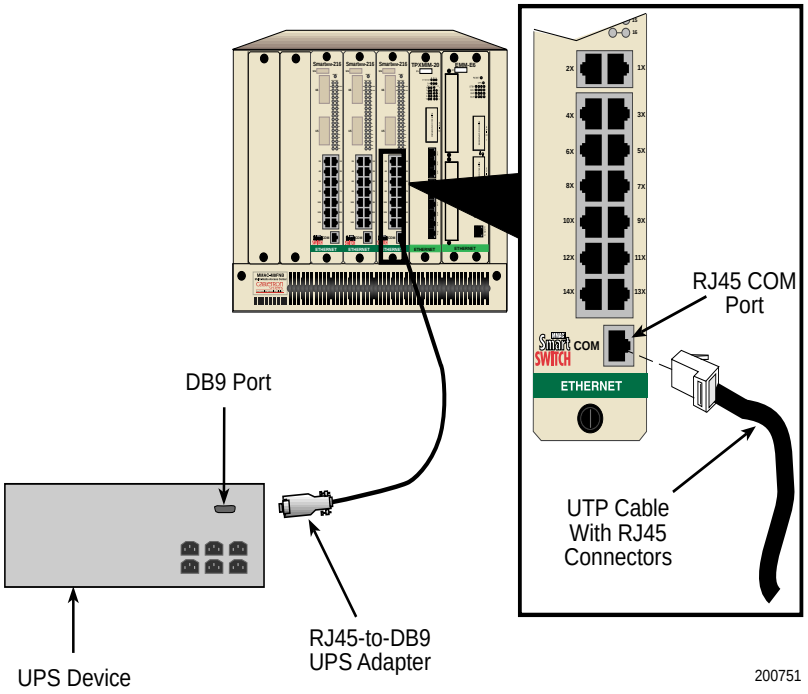



**Figure 5-2 Uninterruptible Power Supply (UPS)**

### 5.3.3 Management Terminal Setup Parameters

Table 5-2 lists the setup parameters for the local management terminal.

**Table 5-2 VT Terminal Setup**

| | |
|---|---|
| **Display Setup Menu** | |
| Columns -> | 80 Columns |
| Controls -> | Interpret Controls |
| Auto Wrap -> | No Auto Wrap |
| Scroll -> | Jump Scroll |
| Text Cursor -> | Cursor |
| Cursor Style -> | Underline Cursor Style |
| **General Setup Menu** | |
| Mode -> | VT100, 7 Bit Controls |
| ID number -> | VT100ID |
| Cursor Keys -> | Normal Cursor Keys |
| Power Supply -> | UPSS DEC Supplemental |
| **Communications Setup Menu** | |
| Transmit -> | 2400, 4800, 9600, 19200 |
| Receive -> | Receive=Transmit |
| XOFF -> | XOFF at 64 |
| Bits -> | 8 bits |
| Parity -> | No Parity |
| Stop Bit -> | 1 Stop Bit |
| Local Echo -> | No Local Echo |
| Port -> | DEC-423, Data Leads Only |
| Transmit -> | Limited Transmit |
| Auto Answerback -> | No Auto Answerback |
| **Keyboard Setup Menu** | |
| Keys -> | Typewriter Keys |
| Auto Repeat -> | any option |
| Keyclick -> | any option |
| Margin Bell -> | Margin Bell |
| Warning Bell -> | Warning Bell |

## 5.4 ACCESSING LOCAL MANAGEMENT

Access to Local Management is controlled through the Password screen Figure 5-3. Whenever a connection is made to the SmartMIM-216 the Password screen displays. Before continuing, the user must enter a password (community name), which is compared to the previously stored passwords. The level of access allowed the user depends on the password. To set or change passwords, refer to Section 5.8. The following steps describe the procedure to access Local Management.

1. Turn on the terminal. Press ENTER (up to four times) until the SmartMIM-216 Local Management Password screen displays.

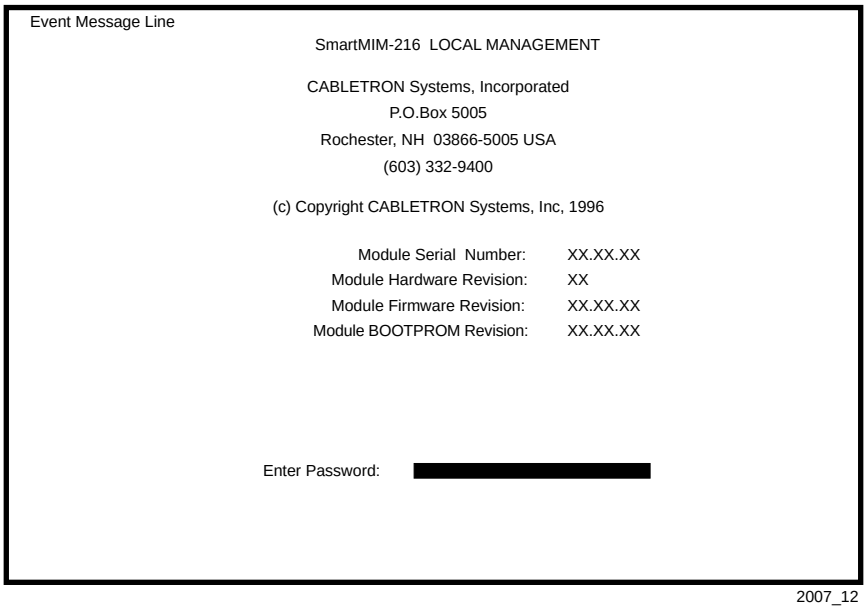



**Figure 5-3 The SmartMIM-216 Local Management Password Screen**

2. Enter the Password and press ENTER. The default super-user access password is "*public*" or press ENTER.


The user's password is one of the community names specified in the SNMP Community Names screen. Access to certain Local Management capabilities depends on the degree of access accorded that community name. Refer to Section 5.8.

- If an invalid password is entered, the terminal beeps and the cursor returns to the beginning of the password entry field.
- Entering a valid password causes the associated access level to display at the bottom of the screen and the Device Menu screen to appear.
- If no activity occurs for several minutes, the Password screen redisplays and the password has to be reentered.

The SmartMIM-216 Local Management consists of a series of menu screens. Navigate through Local Management by selecting items from the menu screens. Figure 5-4 shows the hierarchy of the SmartMIM-216 Local Management screens.

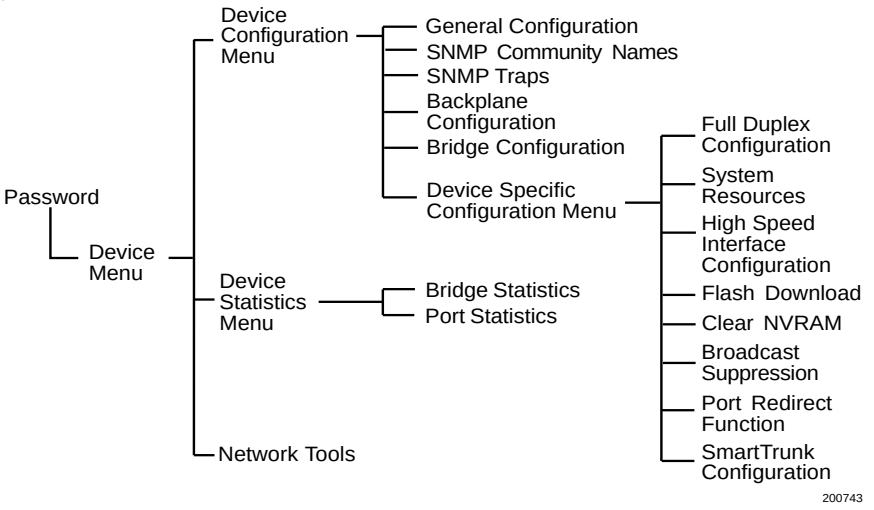



**Figure 5-4 Hierarchy of Local Management Screens**

### 5.4.1 Selecting Local Management Menu Screen Items

Select items on a menu screen by performing the following steps:

1. Use the arrow keys to highlight a menu item.
2. Press ENTER. The selected menu item displays on the screen.

### 5.4.2 Exiting Local Management Screens

Exit a Local Management screen by performing the following steps:

1. Use the arrow keys to highlight the **RETURN** command at the bottom of the Local Management screen.
2. Press ENTER. The previous screen in the Local Management hierarchy displays.


The user can also exit Local Management screens by pressing ESC twice. This exit method does not warn about unsaved changes and all unsaved changes will be lost.

3. Exit from SmartMIM-216 Local Management by repeating steps 1 and 2 until the Device Menu screen displays.
4. Use the arrow keys to highlight the **RETURN** command at the bottom of the Device Menu screen.
5. Press ENTER. The Password screen displays and the session ends.

## 5.5 DEVICE MENU SCREEN

The Device Menu screen, Figure 5-5, is the access point for all Local Management screens.

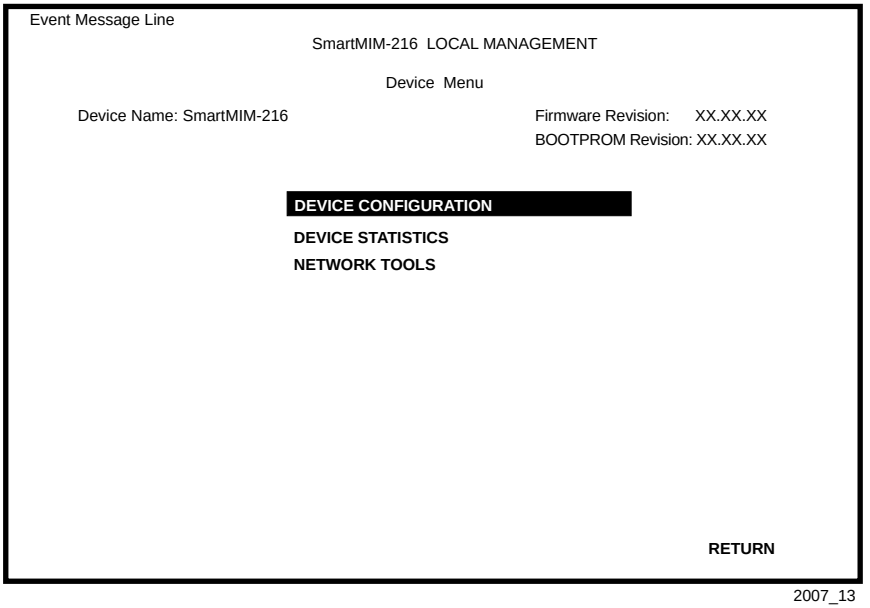



**Figure 5-5 Device Menu Screen**

The following explains each Device Menu screen field as shown in Figure 5-5:

**DEVICE CONFIGURATION**

The Device Configuration Menu screen provides access to the Local Management screens that are used to configure the SmartMIM-216 and also to the Device Specific Configuration Menu screen. The Device Specific Configuration Menu screen provides access to the screens that allow the user to check the SmartMIM-216 resources and set operating parameters specific to each port. For details about the Device Configuration Menu screen, refer to Section 5.6. For details about the Device Specific Configuration Menu screen, refer to Section 5.12.

**DEVICE STATISTICS**

The Device Statistics Menu screen provides statistics and performance information for the SmartMIM-216. For details about this screen, refer to Section 5.21.

**NETWORK TOOLS**

The Network Tools function resides on the SmartMIM-216 and consists of a series of commands that allow the user to access and manage network devices. Section 5.24 explains how to use the Network Tools utility.

If the terminal is idle for several minutes, the Password screen redisplays and the session ends.

## 5.6 DEVICE CONFIGURATION MENU SCREEN

The Device Configuration Menu screen, Figure 5-6, provides access to Local Management screens that allow you to configure and monitor operating parameters, modify SNMP community names, set SNMP traps, configure bridge parameters and configure SmartMIM-216 ports.

Access the Device Configuration Menu screen from the Device Menu screen by using the arrow keys to highlight the **Device Configuration** option and pressing ENTER. The Device Configuration screen displays.

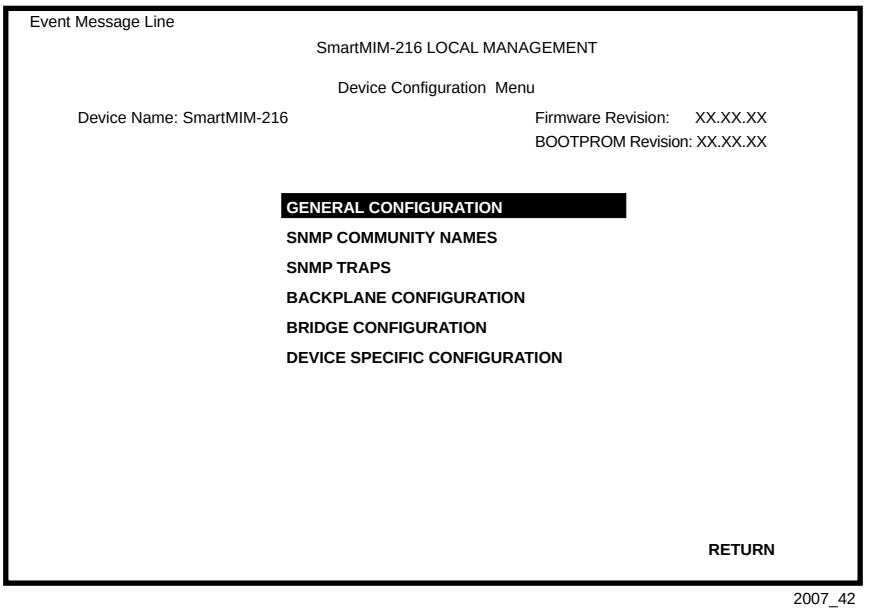



**Figure 5-6 Device Configuration Menu Screen**

The following briefly explains each screen accessible from the Device Configuration Menu screen.

**GENERAL CONFIGURATION**
The General Configuration screen allows the user to monitor and configure operating parameters for the SmartMIM-216. For details, refer to Section 5.7.

**SNMP COMMUNITY NAMES**
The SNMP Community Names screen allows the user to enter new, change, or review the community names used as access passwords for device management operation. Access is limited based on the password level of the user. For details, refer to Section 5.8.

**SNMP TRAPS**
The SNMP Traps screen provides display and configuration access to the table of IP addresses used for trap destinations and associated community names. For details, refer to Section 5.9.

**BACKPLANE CONFIGURATION**
The Backplane Configuration screen allows the user to configure ports 1, 15, and 16 to either the front panel or to one of the backplane channels. For details, refer to Section 5.10.

**BRIDGE CONFIGURATION**
The Bridge Configuration screen provides basic setup options for making a bridge operational in the network. For details, refer to Section 5.11.

**DEVICE SPECIFIC CONFIGURATION**
The Device Specific Configuration Menu screen allows the user to select screens to configure ports or check system resources specific to the SmartMIM-216. For details, refer to Section 5.12.

## 5.7 GENERAL CONFIGURATION SCREEN

The General Configuration screen, Figure 5-7, allows the user to set the system date and time, IP addresses and Subnet Masks, the Default Interface and Default Gateway, the TFTP Gateway IP address, and the COM port configuration.

Access the General Configuration screen from the Device Configuration Menu screen by using the arrow keys to highlight the **General Configuration** option and pressing ENTER. The General Configuration screen displays.

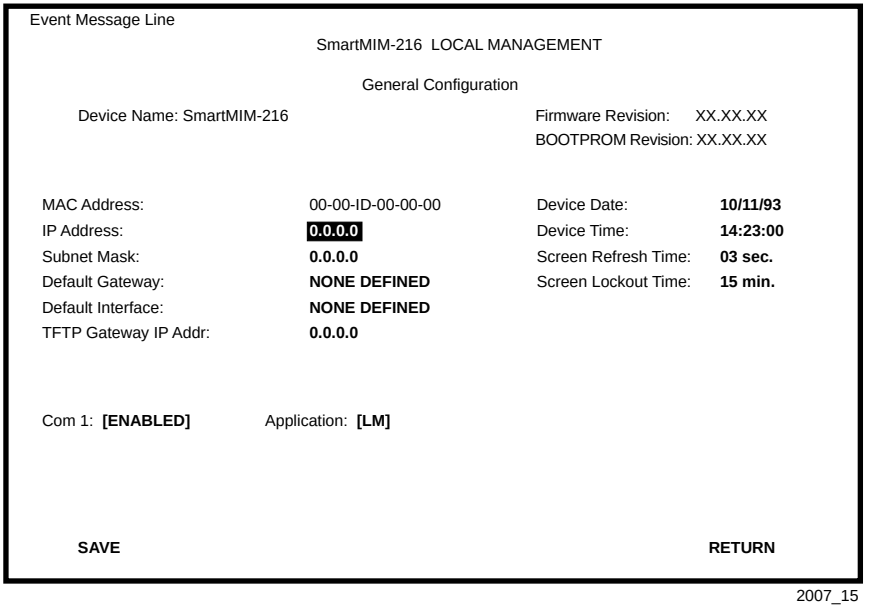



**Figure 5-7 General Configuration Screen**

The following briefly explains each General Configuration screen field:

**MAC Address** (Read-Only)
Displays the physical address of the SmartMIM-216.

**IP Address** (Modifiable)
This displays and allows the user to set the IP address for the SmartMIM-216. To set the IP address, refer to Section 5.7.1. The IP address can also be set through Runtime IP Address Discovery as previously described in Section 1.4.6.

**Subnet Mask** (Modifiable)
Displays the subnet mask for the SmartMIM-216. A subnet mask "masks out" the network bits of the IP address by setting the bits in the mask to 1 when the network treats the corresponding bits in the IP address as part of the network or subnetwork address, or to 0 if the corresponding bit identifies the host. For details about how to change the Subnet Mask from its default value, refer to Section 5.7.2.

**Default Gateway** (Modifiable)
Displays the default gateway for the SmartMIM-216. This field is not defined until an appropriate value is entered. For details about why and how to set the Default Gateway, refer to Section 5.7.3.

**Default Interface** (Modifiable)
Displays the default interface for the SmartMIM-216 default gateway. The field defaults to NONE. For details about when and how to set the Default Interface, refer to Section 5.7.4.

**TFTP Gateway IP Addr** (Modifiable)
Displays and allows the user to set the TFTP Gateway IP address for the SmartMIM-216. To set the TFTP Gateway IP address, refer to Section 5.7.5.

**Device Date** (Modifiable)
Contains a value that the device recognizes as the current date. To set a new device date, refer to Section 5.7.6.

**Device Time** (Modifiable)
Contains a value that the device recognizes as the current time. To enter a new time, refer to Section 5.7.7.

**Screen Refresh Time** (Modifiable)
Contains the rate at which the screens are updated. This setting determines how frequently (in seconds) information is updated on the screen. To enter a new update time, refer to Section 5.7.8.

**Screen Lockout Time** (Modifiable)
Contains the maximum number of minutes that the Local Management application displays a module's screen while awaiting input or action from a user. For example, if the number 5 is entered in this field, the user has up to five minutes to respond to each of the specified module's Local Management screens. In this example, after five minutes of "idleness" (no input or action), the terminal "beeps" five times, the Local Management application terminates the session, and the display returns to the Password screen. To enter a new lockout time, refer to Section 5.7.9.

**Com 1** (Toggle)
This field allows the user to enable or disable the COM port. The selection toggles between **ENABLED** and **DISABLED**. The default is **ENABLED**. For details about setting up the COM port, refer to Section 5.7.10.

**Application** (Toggle)
Displays the application set for the COM port. This field allows the user to set the application that the COM port supports. The field toggles between **LM** (Local Management) and **UPS** (Uninterruptible Power Supply).

The **UPS** setting allows the COM port to be used to monitor an American Power Conversion Smart Uninterruptible Power Supply (UPS).

The baud rate setting for **LM** is automatically sensed. For **UPS**, the baud rate is automatically set to 2400.

The default setting is **LM**. For details about how to configure the COM port for various applications, refer to Section 5.7.10.

### 5.7.1 Setting the IP Address

To set the IP address, perform the following steps:

1. Use the arrow keys to highlight the **IP Address** field.
2. Enter the IP address into this field using Dotted Decimal Notation (DDN) format.

   For example: 134.141.79.120
3. Press ENTER. If the IP address and the format are valid, the cursor returns to the beginning of the IP address field. If the entry is not valid, the Event Message Line displays “INVALID IP ADDRESS OR FORMAT ENTERED”. Local Management does not alter the current value and refreshes the IP address field with the previous value.
4. Use the arrow keys to highlight the **SAVE** command, then press ENTER. The “SAVED OK” message displays indicating that the changes have been saved to memory.


The device automatically resets after a new IP address is saved.

### 5.7.2 Setting the Subnet Mask

If the management workstation that is to receive SNMP traps from the SmartMIM-216 is located on a separate subnet, the subnet mask for the SmartMIM-216 may need to be changed from its default.

To change the subnet mask from its default, perform the following steps:

1. Use the arrow keys to highlight the **Subnet Mask** field.
2. Enter the subnet mask into this field using DDN format.

   For example: 255.255.0.0

3. Press ENTER. If the subnet mask is valid, the cursor returns to the beginning of the Subnet Mask field. If the entry is not valid, the Event Message Line displays “INVALID SUBNET MASK OR FORMAT ENTERED”. Local Management does not alter the current value, but it does refresh the Subnet Mask field with the previous value.
4. Use the arrow keys to highlight the **SAVE** command.
5. Press ENTER. The Event Message Line at the top of the screen displays “SAVED OK”, and the device resets.

### 5.7.3 Setting the Default Gateway

If the SNMP management station is located on a different IP subnet than the SmartMIM-216, a default gateway must be specified. When an SNMP Trap is generated, the SmartMIM-216 sends the Trap to the default gateway. To set the default gateway, perform the following steps:

1. Use the arrow keys to highlight the **Default Gateway** field.
2. Enter the IP address of the default gateway using the DDN format.

   For example: 134.141.79.121
3. Press ENTER. If the IP address entered for the default gateway and the format are correct, the cursor returns to the beginning of the Default Gateway field. If the entry is not valid, the Event Message Line displays “INVALID DEFAULT GATEWAY OR FORMAT ENTERED”. Local Management does not alter the current value, but it does refresh the Default Gateway field with the previous value.
4. Use the arrow keys to highlight the **SAVE** command.
5. Press ENTER. The Event Message Line at the top of the screen displays “SAVED OK”.

### 5.7.4 Setting the Default Interface

The default interface is the interface channel for the designated default gateway. To set the default interface, perform the following steps:

1. Use the arrow keys to highlight the **Default Interface** field.
2. Enter the interface number for the default gateway in this field with a value from 1 to 16.
3. Press ENTER. If the interface number entered is valid, the cursor returns to the beginning of the Default Interface field. If the entry is not valid, the Event Message Line displays "PERMISSIBLE RANGE: 1...16". Local Management does not alter the current value, but it does refresh the Default Interface field with the previous value.
4. Use the arrow keys to highlight the **SAVE** command.
5. Press ENTER. The Event Message Line at the top of the screen displays "SAVED OK".

### 5.7.5 Setting the TFTP Gateway IP Address

If the network TFTP server is located on a different IP subnet than the SmartMIM-216, a Gateway IP address should be specified. To set the TFTP Gateway IP address, perform the following steps:

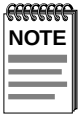
1. Use the arrow keys to highlight the **TFTP Gateway IP Address** field.
2. Enter the IP address of the TFTP gateway using the DDN format.

   For example: 134.141.80.122
3. Press ENTER. If the TFTP gateway IP address entered and the format is valid, the cursor returns to the beginning of the TFTP Gateway IP Address field. If the entry is not valid, the Event Message Line displays "INVALID TFTP GATEWAY IP ADDRESS OR FORMAT ENTERED". Local Management does not alter the current value, but it does refresh the TFTP Gateway IP Address field with the previous value.
4. Use the arrow keys to highlight the **SAVE** command.
5. Press ENTER. The Event Message Line at the top of the screen displays "SAVED OK".

### 5.7.6 Setting the Device Date

To set the system date, perform the following steps:

1. Use the arrow keys to highlight the **Device Date** field.
2. Enter the date in an MM/DD/YY format.




It is not necessary to add separators between month, day, and year numbers, as long as each entry uses two numeric characters. For example, to set the date to 03/17/96, type "031796" in the Device Date field.

3. Press ENTER to set the system calendar to the date in the input field.
4. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

If the date entered is in the correct format, the Event Message Line at the top of the screen displays "SAVED OK". If the entry is not valid, Local Management does not alter the current value, but it does refresh the Device Date field with the previous value.

### 5.7.7 Setting the Device Time

To set the device clock, perform the following steps:

1. Use the arrow keys to highlight the **Device Time** field.
2. Enter the time in a 24-hour format, HH:MM:SS.


When entering the time in the system time field, separators between hours, minutes, and seconds are not needed as long as each entry uses two numeric characters. For example, to set the time to 6:45 A.M., type "064500" in the Device Time field.

3. Press ENTER to set the system clock to the time in the input field.
4. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

If the time entered is in the correct format, the Event Message Line at the top of the screen displays “SAVED OK”. If the entry is not valid, Local Management does not alter the current value and refreshes the Device Time field with the previous value.

### 5.7.8 Entering a New Screen Refresh Time

The screen refresh time is set from 3 to 99 seconds with a default of 3 seconds. To set a new screen refresh time, perform the following steps:

1. Use the arrow keys to highlight the **Screen Refresh Time** field.
2. Enter a number from 3 to 99.
3. Press ENTER to set the refresh time to the time entered in the input field.
4. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

If the time entered is within the 3 to 99 seconds range, the Event Message Line at the top of the screen displays “SAVED OK”. If the entry is not valid, Local Management does not alter the current setting, but it does refresh the Screen Refresh Time field with the previous value.

### 5.7.9 Setting the Screen Lockout Time

The screen lockout time can be set from 1 to 30 minutes with a default of 15 minutes. To set a new lockout time, perform the following steps:

1. Use the arrow keys to highlight the **Screen Lockou**t field.
2. Enter a number from 1 to 30.
3. Press ENTER to set the lockout time in the input field.
4. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

If the time entered is within the 1 to 30 minutes range, the Event Message Line at the top of the screen displays “SAVED OK”. If the entry is not valid, Local Management does not alter the current setting, but it does refresh the Screen Lockout Time field with the previous value.

### 5.7.10 Configuring the COM Port

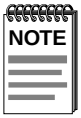
Upon power-up, the COM port is configured to the default settings of **ENABLED** and **LM**.


Before altering the COM port settings, read this entire COM port configuration section. Altering the COM port settings disconnects the Local Management terminal from the port, and ends the Local Management session.

To configure the COM port, the user needs to enable/disable the COM port and select an application.

The SmartMIM-216 COM port supports the following applications:

- Local Management connections
- American Power Conversion Uninterruptible Power Supply (UPS) connections




Refer to the Release Notes included with the SmartMIM-216 to verify which COM Port applications are currently supported.

To configure the COM port, proceed as follows:

1. Use the arrow keys to highlight the **Com 1** field.


Do **NOT** disable or alter the settings of the COM port while operating the current Local Management connection through a terminal. Altering the COM port settings disconnects the Local Management terminal from the port, and ends the Local Management session.If the SmartMIM-216 was previously assigned a valid IP address, reenter Local Management by establishing a TELNET connection to the device. If the device does not have a valid IP address and the COM port connection has been disabled or the settings changed, reset NVRAM on the SmartMIM-216 (refer to Chapter 3) in order to reestablish COM port communications.

2. Press the SPACE bar to choose either **ENABLED** or **DISABLED**. **ENABLED** allows the COM port to be connected to the terminal. **DISABLED** disallows the COM port connection to the terminal.


If the COM port is reconfigured without a valid IP address set on the device, the message shown in Figure 5-8 displays. Do not continue unless the outcome of the action is fully understood.

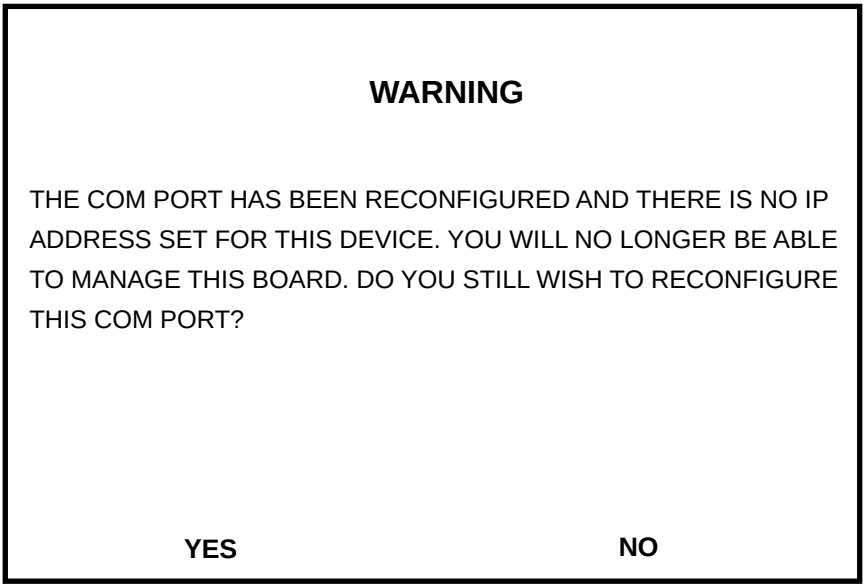



**Figure 5-8 COM Port Warning Screen**

3. Use the arrow keys to highlight **YES**. Press ENTER.
4. If you ENABLED the port, proceed to step 5. If you DISABLED the port, use the arrow keys to highlight **SAVE** at the bottom of the screen, then press ENTER. When the message "SAVED OK" displays, the edits are saved.


Exiting without saving causes the message “NOT SAVED -- PRESS SAVE TO KEEP CHANGES” to appear. Exiting without saving causes all edits to be lost.

5. Use the arrows keys to highlight the Application field.
6. Use the SPACE bar or BACKSPACE to step through the available settings until the desired application displays. Table 5-3 lists the available settings and their corresponding applications.

**Table 5-3 COM Port Application Settings**

| Setting | Application |
|---|---|
| [LM] | Local Management Session |
| [UPS] | APC Power Supply SNMP Proxy |

7. Press ENTER to accept the application.
8. Use the arrow keys to highlight **SAVE** at the bottom of the screen, then press ENTER.When the message “SAVED OK” displays, the edits are saved.

## 5.8 SNMP COMMUNITY NAMES SCREEN

The SNMP Community Names screen, Figure 5-9, allows the super-user to set SNMP Management community names. Community names act as passwords to Local/Remote Management and are agents of security access to the SmartMIM-216. Access to the SmartMIM-216 is controlled by enacting any of three different levels of security authorization (read-only, read-write, and super-user).


Super-user access gives the user full management privileges, allows existing passwords to be changed, and all modifiable MIB objects for the Cabletron Container MIB and Internet MIB-II to be edited.

Access the SNMP Community Names screen from the Device Configuration Menu screen by using the arrow keys to highlight the **SNMP Community Names** option and pressing ENTER. The SNMP Community Names screen displays.

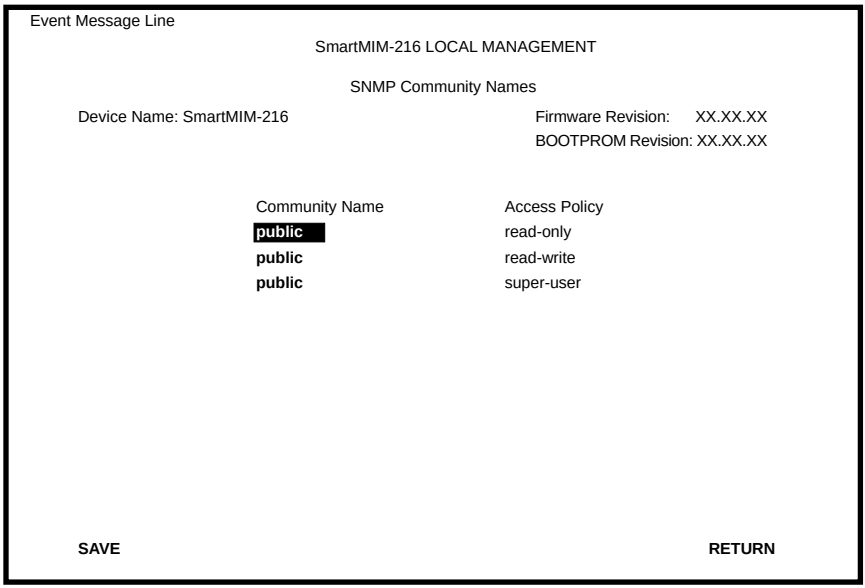



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**Figure 5-9 The SNMP Community Names Screen**

The following explains each SNMP Community Names screen field:

**Community Name** (Modifiable)
Displays the user-defined name through which a user accesses the SmartMIM-216 SNMP Management. Any community name assigned here acts as a password for Local/Remote Management. Refer to Section 5.8.1 for details.

**Access Policy** (Read-Only)
Indicates the access accorded each community name. Possible selections are as follows:

| | |
|---|---|
| **read-only** | This community name allows read-only access to the SmartMIM-216 MIB objects, and excludes access to security-protected fields of read-write or super-user authorization. |
| **read-write** | This community name gives read-write access to the SmartMIM-216 MIB objects, excluding security protected fields for super-user access only. |
| **super-user** | This community name permits read-write access to the SmartMIM-216 MIB objects and allows the user to change all modifiable parameters including community names, IP addresses, traps, and SNMP objects. |

### 5.8.1 Establishing Community Names

The password used to access Local Management at the Password Screen must have super-user access to view and edit the SNMP Community Names screen.


Any community name assigned in the SNMP Community Names screen is a password to its corresponding level of access to Local Management. The community name assigned super-user access is the only one that gives the user complete access to Local Management.

To establish community names, proceed as follows:

1. Use the arrow keys to highlight the **Community Name** field adjacent to the selected access level.
2. Enter the password in the field (maximum 31 characters).
3. Press ENTER.
4. Repeat steps 1 through 3 to modify the other community names.
5. Use the arrow keys to highlight **SAVE** at the bottom of the screen and press ENTER. The message “SAVED OK” displays. The community names are saved to memory and their access modes implemented.


Exiting without saving causes a “NOT SAVED?” message to display above the **SAVE** command. Edits will be lost if they are not saved before exiting.

6. To exit the screen, use the arrow keys to highlight **RETURN** and press ENTER.

## 5.9 SNMP TRAPS SCREEN

Since the SmartMIM-216 is an SNMP compliant device, it can send messages to multiple Network Management Stations to alert users of status changes. The SNMP Traps screen is shown in Figure 5-10.

Access the SNMP Traps screen from the Device Configuration Menu screen by using the arrow keys to highlight the **SNMP Traps** option and pressing ENTER. The SNMP Traps screen displays.

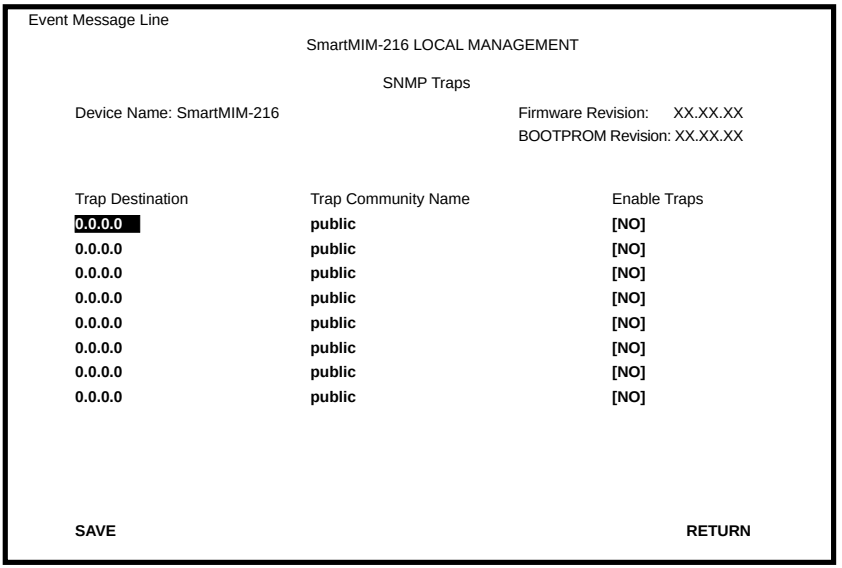


**Figure 5-10 The SNMP Traps Screen**

The following explains each field of the SNMP Traps screen.

**Trap Destination** (Modifiable)
Indicates the IP address of the workstation to receive trap alarms. Up to eight different destinations can be defined.

**Trap Community Name** (Modifiable)
Displays the Community Name included in the trap message sent to the Network Management Station with the associated IP address.

**Enable Traps** (Toggle)
Enables transmission of the traps to the network management station with the associated IP address. This field toggles between **[YES]** and **[NO]**.

### 5.9.1 Configuring the Trap Table

To configure the Trap table, proceed as follows:

1. Using the arrow keys, highlight the appropriate **Trap Destination** field.
2. Enter the IP Address of the workstation that is to receive traps. IP address entries must follow the DDN format.

   For example: 134.141.79.121
3. Press ENTER. If an invalid entry is entered "INVALID IP ENTERED" displays in the Event Message Line.
4. Using the arrow keys, highlight the **Trap Community Name** field.
5. Enter the community name.
6. Press ENTER.
7. Using the arrow keys, highlight the **Enable Traps** field. Press the SPACE bar to choose either **[YES]** (send alarms from the SmartMIM-216 to the workstation), or **[NO]** (prevent alarms from being sent).
8. Using the arrow keys, highlight the **SAVE** option and press ENTER. The message "SAVED OK" displays on the screen.


Exiting without saving causes a "NOT SAVED?" message to appear above the **SAVE** command. Edits will be lost if they are not saved before exiting.

9. To exit the screen, use the arrow keys to highlight **RETURN** and press ENTER.

The designated workstations will now receive traps from the SmartMIM-216.

## 5.10 BACKPLANE CONFIGURATION SCREEN

The Backplane Configuration screen, Figure 5-11, allows the user to set the switching function of port 1 to be redirected to Channel A in the MMAC, so the SmartMIM-216 can communicate with modules in the hub for in-band Local Management and other functions. However, in this setting the front panel port 1 of the SmartMIM-216 is not operational.

The user can also configure ports 15 and 16 to switch traffic to one of the 100 Mbps Fast Ethernet (FE) Channels 1, 2, and 3. These channels provide fast communication between the SmartMIM-216 modules.

Access the Backplane Configuration screen from the Device Configuration screen by using the arrow keys to highlight the **Backplane Configuration** screen and pressing ENTER. The Backplane Configuration screen displays.

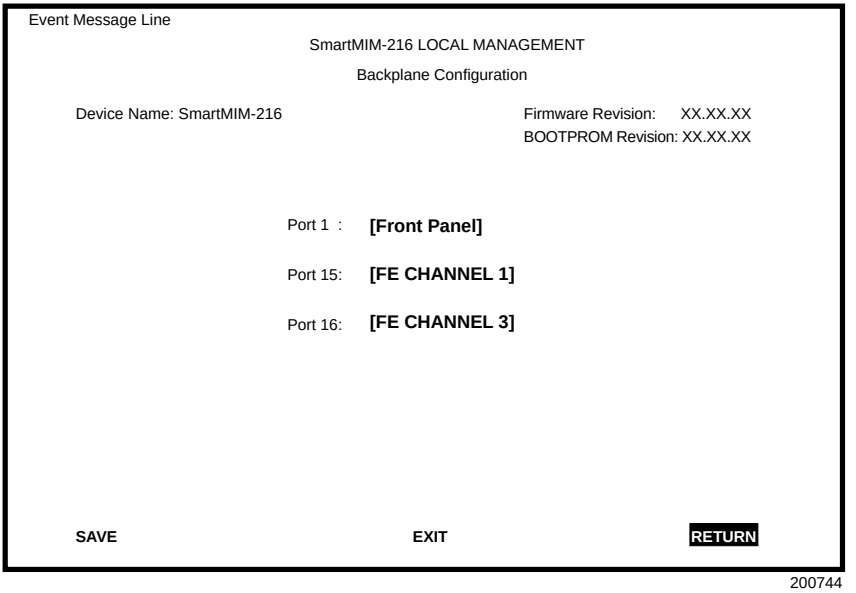


**Figure 5-11 Backplane Configuration Screen**

The following explains each field of the Backplane Configuration screen:

**Port Number** (Read-only)
Identifies the number of the port, either 1, 15, or 16.

**Configuration Field** (Selectable)
Allows the user to configure the port. The valid options are as follows:

| | |
|---|---|
| Port 1[1] | Front Panel |
| | Channel "A" |
| Port 15[2] | Front Panel |
| | FE CHANNEL 1 |
| | FE CHANNEL 2 |
| Port 16[2] | Front Panel |
| | FE CHANNEL 2 |
| | FE CHANNEL 3 |

1. When the port 1 switching function is set for Channel A, the front panel port 1 is not operational.
2. Only one port (port 15 or 16) may be set at any one time to direct traffic to FE CHANNEL 2.

## 5.10.1 Configuring the Port

To configure ports 1, 15, or 16, proceed as follows:

1. Use the arrow keys to highlight the configuration field to the right of the selected port (1, 15 or 16).
2. Press the SPACE bar to select the desired configuration.
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message "SAVED OK" displays. However, if two ports are assigned to FE Channel 2, the Event Message Line reads "REASIGN PORT AND SAVE AGAIN".

## 5.11 BRIDGE CONFIGURATION SCREEN

The Bridge Configuration screen, Figure 5-12, provides the basic setup options to make a bridge operational in your network.

Access the Bridge Configuration screen from the Device Configuration menu by using the arrow keys to highlight the **Bridge Configuration** option and pressing ENTER. The Bridge Configuration screen displays showing ports 1 through 8. To view or edit the fields for ports 9-16, highlight **[9-16]** at the bottom of the screen and press the ENTER key.

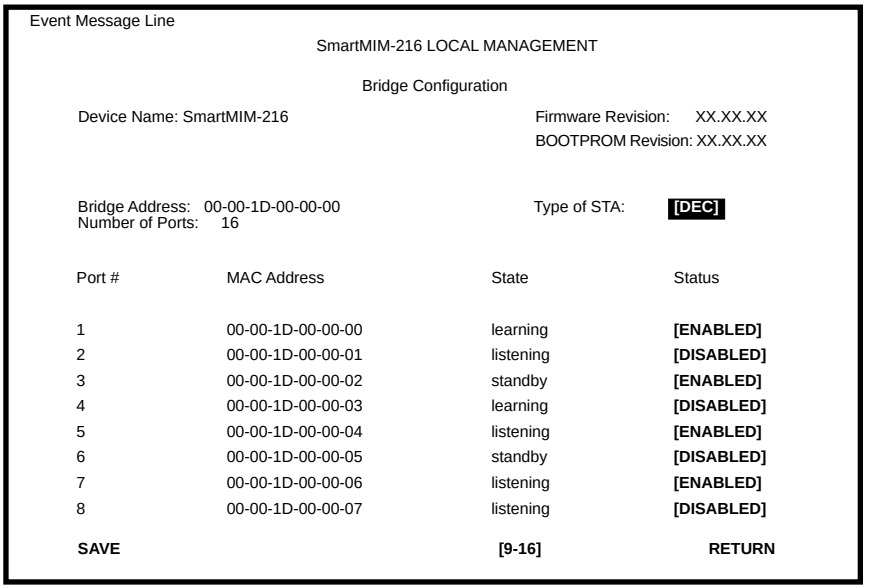


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**Figure 5-12 Bridge Configuration Screen**

The following describe each field of the Bridge Configuration screen:

**Bridge Address** (Read-Only)
Displays the MAC address of the bridge.

**Number of Ports** (Read-Only)
Displays the total number of bridged ports on the SmartMIM-216.

**Type of STA** (Toggle)
Allows the user to set the method that bridges use to decide which bridge is the controlling (Root) bridge when two or more bridges exist in parallel (Spanning Tree Algorithm). Valid entries include IEEE, DEC, and None. To set the STA, refer to Section 5.11.1.

**Port #** (Read-Only)
Lists each bridge port on the device. If the number of ports is greater than eight, then the additional ports are listed on subsequent screens.

**MAC Address** (Read-Only)
Displays the hardware address assigned to each listed port.

**State** (Read-Only)

| | |
|---|---|
| Disabled | Management disabled this interface. No traffic is received or forwarded while the interface is disabled. |
| Learning | The bridge is learning the network address of this interface. The bridge enters the learning state when the Transparent Database is created (during start-up or after being deleted), or when the Spanning Tree Algorithm detects a network topology change. |
| Listening | The bridge is not adding information to the Transparent Database. The bridge is monitoring BPDU traffic while preparing to move from the learning to the forwarding state. |
| Forwarding | The bridge is on line and this interface is forwarding traffic. |
| Blocking | This interface will not forward any traffic through the bridge because a loop condition was detected by the STA. |

**Status** (Toggle)
Allows the user to disable or enable a port by setting the status of the listed interface to either **ENABLED** or **DISABLED**. To set the port status, refer to Section 5.11.2.

**[1-8]** and **[9-16]** (Navigation Key)
When the Bridge Configuration screen displays, the current status information displays for the first eight ports. The **[9-16]** field allows the user to step to a second screen for the same type of information for ports 9 through 16. While on the second screen, this field changes to **[1-8]** so the user can navigate back to the first screen. The user can change the Status fields while in either the first or second screen.

### 5.11.1 Setting the STA

The Spanning Tree Algorithm (STA) setting allows the user to set the method that the bridges use to decide which is the controller (Root) bridge when two or more bridges are in parallel. The available selections are **IEEE**, **DEC**, and **NONE**.

To set the STA, proceed as follows:

1. Use the arrow keys to highlight the **Type of STA** field.
2. Use the SPACE bar to step to the appropriate setting (**IEEE**, **DEC**, or **NONE**).
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays.

### 5.11.2 Setting (Enabling or Disabling) the Port Status

To set the status of an interface (port), proceed as follows:

1. Use the arrow keys to highlight the **Status** field of the port. To view or edit the fields for ports 9-16, highlight **[9-16]** at the bottom of the screen and press RETURN.
2. Use the SPACE bar to toggle to either **ENABLED** or **DISABLED**.
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays.

## 5.12 DEVICE SPECIFIC CONFIGURATION MENU SCREEN

The Device Specific Configuration Menu screen, Figure 5-13, allows the user to select screens to configure ports or check system resources specific to the SmartMIM-216.

Access the Device Specific Configuration Menu screen from the Device Configuration Menu screen by using the arrow keys to highlight the **Device Specific Configuration Menu** option and pressing ENTER. The Device Specific Configuration Menu screen displays.

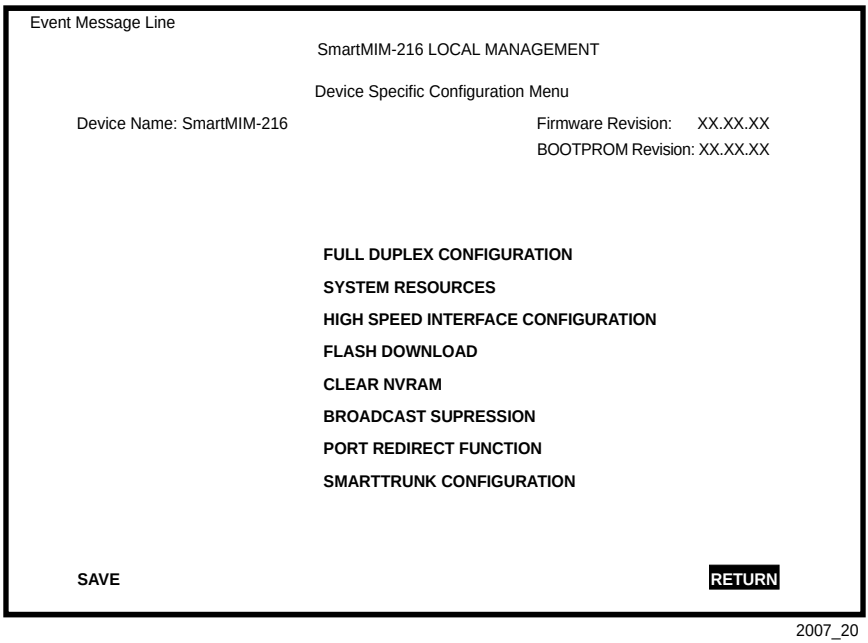


**Figure 5-13 Device Specific Configuration Menu Screen**

The following explains each field of the Device Specific Configuration Menu screen:

### Full Duplex Configuration

The Full Duplex Configuration screen allows each port (1 to 14) to be set for either Standard Ethernet or Full Duplex operation. The screen also indicates whether or not each port is linked to another 10BASE-T device and if that port is enabled. For details, refer to Section 5.13.

### System Resources

The System Resources screen displays the amount of FLASH memory, DRAM and NVRAM installed, indicates the amount of available memory, and provides information on SmartMIM-216 operation. For details, refer to Section 5.14.

### High Speed Interface Configuration

The High Speed Interface Configuration screen indicates which Fast Ethernet Interface Modules are installed in ports 15 and 16, their current operating mode, and if the ports are Linked. It also permits the Auto-Negotiation and Advertised Ability features to be enabled or disabled. For details, refer to Section 5.15.

### FLASH Download

This screen allows the user to download information from FLASH memory and force the SmartMIM-216 to download a new image file from a TFTP server. For details, refer to Section 5.16.

### Clear NVRAM

This screen allows the user to reset NVRAM to the factory default settings. All user-entered parameters such as the IP address and Community Names are then replaced with the SmartMIM-216 default configuration settings. For details, refer to Section 5.17.

### Broadcast Suppression

The Broadcast Suppression selection accesses the Broadcast Statistics screen, which allows the user to check the broadcast statistics of each port such as the number of frames received, peak rate, and the time since the last peak of frames was received. The Broadcast Statistics screen allows the user to set a desired limit of received broadcast frames that will be forwarded per port per second. For details, refer to Section 5.18.

### Port Redirect Function

This screen allows the user to redirect traffic from one or multiple ports to a specific destination port. For details, refer to Section 5.19.

### SmartTrunk Configuration

The SmartTrunk Configuration screen allows the user to logically group interfaces together between devices to achieve greater bandwidth between the devices. For details, refer to Section 5.20.

## 5.13 FULL DUPLEX CONFIGURATION SCREEN

The Full Duplex Configuration screen, Figure 5-14, allows the user to set ports 1 through 14 individually or all at once, to either Standard Ethernet or Full Duplex operation and monitor each port to see whether or not it is enabled and linked to another 10BASE-T device. To set the Operation Mode for port 15 and 16, refer to Section 5.15.

Access the Full Duplex Configuration screen from the Device Specific Configuration Menu screen by using the arrow keys to highlight the **Full Duplex Configuration** option in the Device Specific Configuration Menu screen and pressing ENTER. The Full Duplex Configuration screen displays.

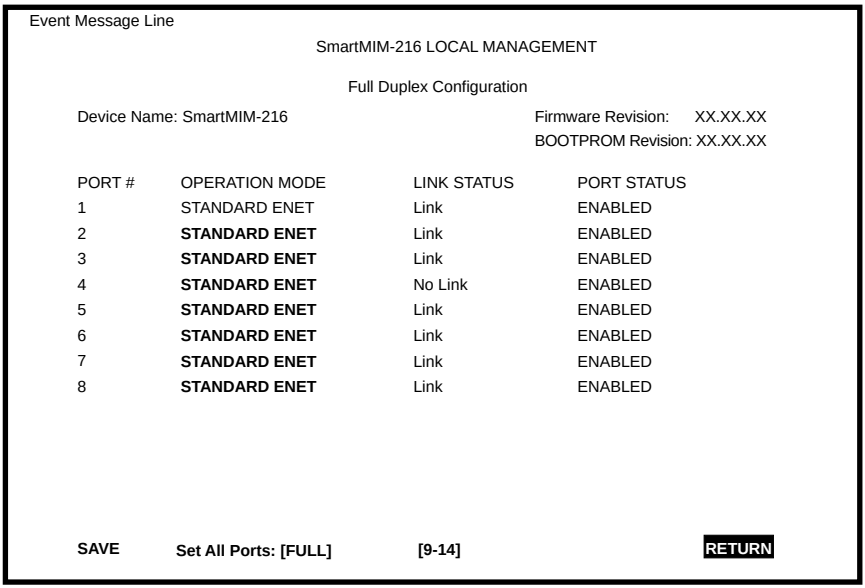


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**Figure 5-14 Full Duplex Configuration Screen**


If port 1 was redirected to the backplane Channel “A” using the Backplane Configuration screen, Port 1 in the Full Duplex Configuration screen will not be highlighted as shown in Figure 5-14.

This section explains each field of the Full Duplex Configuration screen.

**Port #** (Read-only)
Identifies the number of the port.

**Operation Mode** (Toggle)
Allows the user to set the specified port to transmit and receive data separately (Standard) or simultaneously (Full duplex). Set this field to one of the following values:

- **STANDARD ENET –** The port is running at 10 Mbps (default) and either transmits data or receives data, but not both at the same time. To set Ethernet ports for Standard operation, refer to Section 5.13.1.
- **FULL DUPLEX –** The port transmits and receives data at the same time (full duplex) and effectively moves data at 20 Mbps. To set Ethernet ports for Full Duplex operation, refer to Section 5.13.1.

**Link Status** (Read-only)
Indicates whether there is a physical connection from this port to another 10BASE-T device. One of the following values display:

- **Link –** There is a 10BASE-T link signal present; there is a valid physical connection from this port to another 10BASE-T device.
- **No Link –** No 10BASE-T link signal present; there is no valid physical connection from this port to another 10BASE-T device.

**Port Status** (Read-only)
Indicates whether the port was turned on or off administratively. One of the following values display:

- **ENABLED –** The port is turned on administratively.
- **DISABLED –** The port is turned off administratively.


Enabling or disabling ports from the Bridge Configuration screen is described in Section 5.11.2.

**Set All Ports** (Toggle)
All ports 1 through 14 can be set at once to either **STANDARD** or **FULL** from this field. To set ports, refer to Section 5.13.1.


Port 1 cannot be set to Full Duplex if it has been redirected to backplane Channel "A."

**[1-8]** and **[Ports 9-14]** (Navigation Key)
When the Full Duplex Configuration screen displays, the current operation mode and status information are displayed for the first eight ports. This field allows the user to step to a second screen for the same type of information displayed for ports 9 through 14. While on the second screen, this field changes to **[1-8]** so the user can navigate back to the first screen. The user can change the Operation Mode fields while in either the first or second screen.

## 5.13.1 Setting the Operation Mode

The Operation Mode for each Ethernet port may be set to either Standard Ethernet or Full Duplex. The ports may be set one at a time or all at once.

To set the Operation Mode for individual ports, proceed as follows:

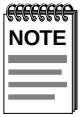
1. Use the arrow keys to highlight the **Operation Mode** field adjacent to the number of the port to have its Operation Mode changed.


Port 1 cannot be set to Full Duplex if it has been redirected to the backplane Channel "A."

The Operation Mode for the first 8 ports can be changed on the first screen. To display the Operation Mode for Ports 9 through 14, use the arrow keys to highlight the **[9-14]** field and press ENTER.

2. Press the SPACE bar until **STANDARD ENET** or **FULL DUPLEX** displays in the field.
3. Use the arrow keys to highlight the **SAVE** command on the bottom line of the screen.
4. Press ENTER. The message "SAVED OK" displays.

To set the Operation Mode for all ports (1-14) at once, proceed as follows:



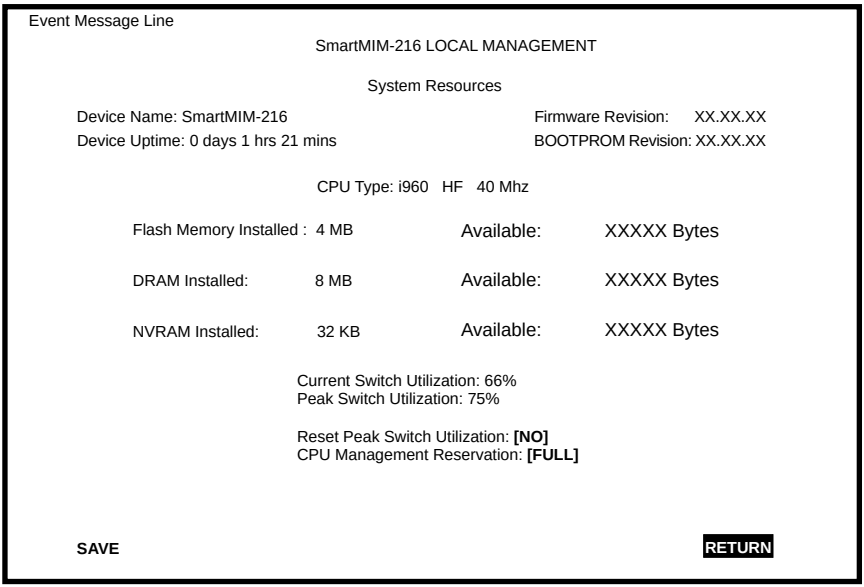

Port 1 cannot be set to Full Duplex if it has been redirected to backplane Channel "A."

1. Use the arrow keys to highlight the **SET ALL PORTS** field.
2. Press the SPACE bar until **FULL** or **STANDARD** displays.
3. Use the arrow keys to highlight the **SAVE** command on the bottom line of the screen.
4. Press ENTER. The message "SAVED OK" displays.

## 5.14 SYSTEM RESOURCES SCREEN

The System Resources screen, Figure 5-15, provides information concerning the processor used in the SmartMIM-216, the amount of FLASH memory, DRAM, and NVRAM that is installed, and how much of that memory is available.

Access the System Resources screen from the Device Specific Configuration Menu screen by using the arrow keys to highlight the **System Resources** option and pressing ENTER. The System Resources screen displays.




2007_23

**Figure 5-15 System Resources Screen**

The following briefly explains each field of the System Resources screen.

**Device Uptime** (Read-only)
The time in days/hours/minutes that the device has been continuously running.

**CPU Type** (Read-only)
Indicates the microprocessor used in the SmartMIM-216.

**Flash Memory Installed** (Read-only)
Indicates the amount of FLASH memory installed in the SmartMIM-216 and how much is currently available.

**DRAM Installed** (Read-only)
Indicates the amount of DRAM installed in the SmartMIM-216 and how much of it is currently available.

**NVRAM Installed** (Read-only)
Indicates the amount of NVRAM installed in the SmartMIM-216 and how much of it is currently available.

**Current Switch Utilization** (Read-only)
Shows how much (percentage of capacity) the SmartMIM-216 is currently being used.

**Peak Switch Utilization** (Read-only)
Shows the peak percentage of maximum switching capacity, since last reset.

**Reset Peak Switch Utilization** (Toggle)
Allows the user to reset the Peak Switch Utilization field to the system traffic at the time of reset. The switch may be set to either **YES** or **NO** as described in Section 5.14.1. **YES** resets the Peak Switch Utilization field.

**CPU Management Reservation** (Toggle)
May be set to **OFF**, **LIMITED**, or **FULL** as described in Section 5.14.2.

- **OFF –** During high traffic loads, management is given a low priority and bridging is given the highest priority. Frames are not dropped unless they exceed the maximum throughput for the device. Latency is at a minimum. However, contact with management may be lost.
- **LIMITED –** Management is given a higher priority. Frames may be dropped, and management may be slow.
- **FULL –** Management is given the highest priority. Frames may be dropped. Management is very responsive.

### 5.14.1 Resetting the Reset Peak Switch Utilization

Set the Reset Peak Switch Utilization field to **YES** or **NO** as follows:

1. Use the arrow keys to highlight the **Reset Peak Switch Utilization** field.
2. Press the SPACE bar to select **YES** or **NO**.
3. Use the arrows keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays.

### 5.14.2 Setting the CPU Management Reservation

To set the CPU Management Reservation to **OFF**, **LIMITED**, or **FULL**, proceed as follows:

1. Use the arrow keys to highlight the **CPU Management Reservation** field.
2. Press the SPACE bar to select **OFF**, **LIMITED**, or **FULL**.
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays.

## 5.15 HIGH SPEED INTERFACE CONFIGURATION SCREEN

The High Speed Interface Configuration screen, Figure 5-16, applies only to ports 15 and 16. This screen supports the FE-100TX, FE-100FX, and the FE-100F3 Fast Ethernet Interface Modules that operate at 100 Mbps.

The High Speed Interface Configuration screen displays the types of interfaces installed in ports 15 and 16, their current operating mode, and indicates if the ports are linked. This screen also allows the user to enable or disable Auto-Negotiation and set the Advertised Ability when the ports are directed to the Front Panel.

The High Speed Interface Configuration screen is accessed from the Device Specific Configuration Menu screen by using the arrow keys to highlight the **High Speed Interface Configuration** option and pressing ENTER. The High Speed Interface Configuration screen displays.

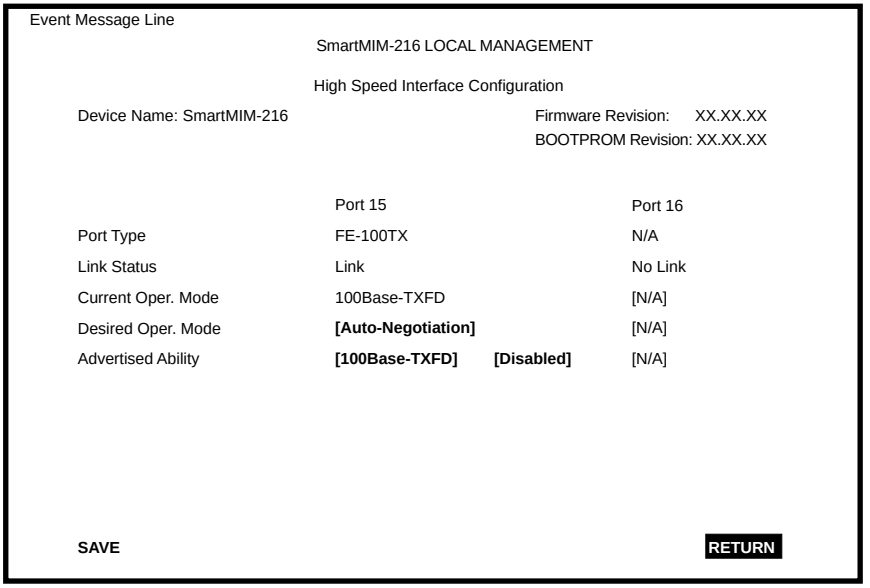



**Figure 5-16 High Speed Interface Configuration Screen**

The following briefly explains each field of the High Speed Interface Configuration screen.

**Port Type** (Read-only)
Displays the type of Fast Ethernet Interface Module (FE-100FX, FE-100TX, FE-100F3, or N/A) installed in ports 15 and 16. Figure 5-16 shows that there is an FE-100TX interface installed in Port 15 and no interface indicated by **[N/A]** in Port 16.

**Link Status** (Read-only)
Indicates whether or not there is a physical connection from this port to another 10BASE-T or 100BASE-TX/FX device. One of the following values display:

- Link – There is a link signal present and a valid physical connection to another device.
- No Link – There is no link signal present and no valid physical connection to another device.

**Current Oper. Mode** (Read-only)
This field displays the current operating mode of ports 15 and 16. Depending on whether a 100BASE-FX, 100BASE-F3, or 100BASE-TX is installed, this field displays the following:

- With a 100BASE-FX or 100BASE-F3 interface: 100Base-FX, 100Base-FXFD (full duplex), or N/A, if the port is empty
- With a 100BASE-TX interface: Unknown, 10Base-T, 10Base-TFD (full duplex), 100Base-TX, 100Base-TXFD (full duplex), or N/A, if the port is empty

**Desired Oper. Mode** (Selectable)
This field allows the user to select the desired operational mode for an interface in port 15 or 16 when the ports are directed to the front panel. The field toggles between **100Base-FX** and **100Base-FXFD** (full duplex) when an FE-100FX or FE-100F3 is installed. Section 5.15.1 describes how to configure a port with an FE-100FX or FE-100F3.


In normal operation, the port with an FE-100TX installed automatically establishes a link with the device at the other end of the segment without requiring user setup. However, Local Management provides the user with the option of manually configuring that port.

If an FE-100TX is installed, the field steps to **Auto-Negotiation**, **10Base-T**, **10Base-TFD** (full duplex), **100Base-TX**, and **100Base-TXFD** (full duplex). In normal operation, the port with an FE-100TX installed is capable of auto-negotiating the operational mode and no further user setup is required. Section 5.15.3 describes how to manually configure an FE-100TX.

In Auto-Negotiation, the FE-100TX negotiates to the highest common denominator of the two interfaces. The order of priority of negotiation is 100BASE-TXFD, 100BASE-TX, 10BASE-TFD, and 10BASE-T.

**Advertised Ability** (Selectable)
During auto-negotiation, the FE-100TX sends information about its capability to the device at the other end of the segment. The capabilities of a port (15 or 16) with an FE-100TX installed are 10Base-T, 10Base-TFD (full duplex mode), 100Base-TX and 100Base-TXFD (full duplex mode). In normal operation, with all capabilities enabled, the FE-100TX "advertises" that it has the ability to operate in any mode. The Network Manager may choose to set up the port so that only a portion of the available capabilities are advertised and the others are disabled. For example, only 100BASE-TX and 100BASE-TXFD might be enabled so that only devices that operate at 100 Mbps can communicate with that port. Section 5.15.5 describes how to enable or disable advertised modes.

### 5.15.1 Configuring an FE-100FX or FE-100F3 in Port 15 or 16

When an FE-100FX or FE-100F3 is installed in port 15 or 16, it must be manually set to operate in the same mode as the device at the other end of the connected segment. Section 5.15.2 provides instructions for manually configuring the port with an FE-100FX or FE-100F3 interface.

### 5.15.2 Setting the FE-100FX or FE-100F3 Operational Mode

Use this field to set the active technology. This field toggles between **100Base-FX** and **100Base-FXFD** (full duplex). To set the active technology through Local Management, proceed as follows:

1. Use the arrow keys to highlight the **Desired Operational Mode** field.
2. Use the SPACE bar to select **100Base-FX** or **100Base-FXFD** (full duplex).
3. Press ENTER. The port now operates in the chosen mode.
4. Use the arrow keys to highlight the **SAVE** command. Press ENTER. The message "SAVED OK" displays and Local Management saves the changes to memory.

### 5.15.3 Configuring an FE-100TX in Port 15 or 16

In normal operation, a port (15 or 16) with an FE-100TX interface automatically establishes a link with the device at the other end of the segment and no user setup is required. Section 5.15.4 and Section 5.15.5 provide instructions for manually configuring the port with an FE-100TX installed.

### 5.15.4 Setting the FE-100TX Operational Mode

Use this field to set the active technology. This field steps to **Auto-Negotiation**, **10Base-T**, **10Base-TFD** (full duplex), **100Base-TX**, and **100Base-TXFD** (full duplex). If **Auto-Negotiation** is selected, the FE-100TX automatically sets the active technology. To manually set the active technology through Local Management, proceed as follows:

1. Use the arrow keys to highlight the **Desired Operational Mode** field.
2. Use the SPACE bar to select the desired mode. Press ENTER. If any mode other than **Auto-Negotiation** is selected, the port only operates in the chosen mode and Auto-Negotiation is disabled.

3. Use the arrow keys to highlight the **SAVE** command. Press ENTER. The message "SAVED OK" displays and Local Management saves the changes to memory. The selected mode displays in both the **Desired Operational Mode** field and the **Current Operational Mode** field.

### 5.15.5 Setting the FE-100TX Advertised Ability

In normal operation, a port (15 or 16) with an FE-100TX auto-negotiates to the highest speed possible. Under some circumstances, the Network Administrator may want the port to advertise only some of the available modes and not operate in other modes. This field steps to **10Base-T**, **10Base-TFD** (full duplex), **100Base-TX**, and **100Base-TXFD** (full duplex). To set the advertised ability, proceed as follows:

1. Use the arrow keys to highlight the **Advertised Ability** field.
2. Use the SPACE bar to select the desired mode.
3. Use the LEFT-ARROW key to move back to the **Advertised Ability** selection and use the SPACE bar to select the next mode to enable or disable.
4. Use the RIGHT-ARROW key to move across to the **Enabled/Disabled** field to the right of the selection.
5. Use the SPACE bar to select **Enabled** or **Disabled**. Press ENTER. Continue this process until you have completed enabling or disabling the advertised modes.
6. Use the arrow keys to highlight the **SAVE** command. Press ENTER. The message "SAVED OK" displays and Local Management saves the changes to memory.

## 5.16 FLASH DOWNLOAD SCREEN

The Flash Download screen, shown in Figure 5-17, allows the user to clear the information stored in the SmartMIM-216 FLASH memory and download a new image file from a TFTP server.


The user may also force a download by changing the position of Switch 6 located on the side of the device. Refer to Section 3.2, **Setting the Mode Switches**, for details.

Before downloading a new image to the device, load the image onto the network TFTP server.


For information on how to set up a workstation as a TFTP server, refer to the specific workstation documentation.

Access the Download screen from the Device Specific Configuration screen by using the arrow keys to highlight the **Flash Download** option and pressing ENTER. The Flash Download screen displays.

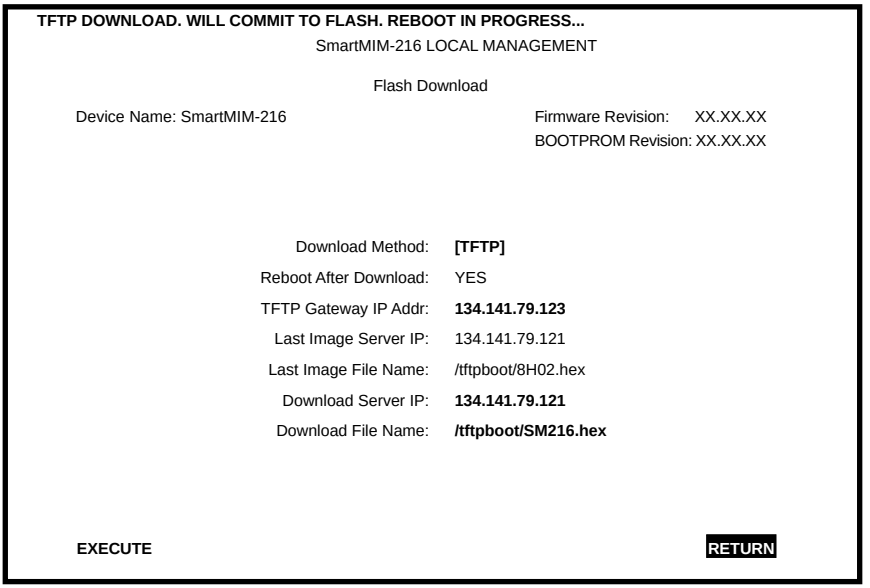



**Figure 5-17 Flash Download Screen**

The following briefly explains each field of the Flash Download screen:

**Download Method** (Selectable)
This field toggles between **BOOTP** and **TFTP**. If set for BootP, the device sends out a BootP request to determine the IP address of the TFTP server and the filename of the image to be downloaded. If set for **TFTP**, the SmartMIM-216 attempts a TFTP download based on the IP address and filename entered in the fields at the bottom of the Flash Download screen. Section 5.16.1 describes how to download using BootP. Section 5.16.2 describes how to download using TFTP.

**Reboot After Download** (Read-only)
This field notifies the user that the SmartMIM-216 will reboot after the download is complete.

**TFTP Gateway IP Addr** (Selectable)
This field shows the IP address of the TFTP gateway server defined in the General Configuration screen in Section 5.7.5, **Setting the TFTP Gateway IP Address**.

**Last Image Server IP** (Read-only)
This field shows the IP address of the server used for the previous FLASH Download.

**Last Image File Name** (Read-only)
This field shows the complete path and file name of the last image downloaded to FLASH.

If **TFTP** or **RUNTIME** is selected as the download method (Figure 5-17), the following two additional fields appear:

**Download Server IP** (Selectable)
The IP address of the TFTP server to be used for the FLASH download is entered in this field.

**Download File Name** (Selectable)
The complete TFTP Server path and file name of the new image is entered in this field.

### 5.16.1 Image File Download Using BootP

To download FLASH to the SmartMIM-216 using BootP, proceed as follows:

1. Use the arrow keys to highlight the **Download Method** field.
2. Use the SPACE bar to select **BOOTP**.
3. Use the arrow keys to highlight the **TFTP Gateway IP Addr** field.
4. Set the IP address of the TFTP gateway server (this defaults to the same IP address set in the TFTP Gateway IP Addr field in the General Configuration screen).
5. Use the arrow keys to highlight **EXECUTE** at the bottom of the screen and press ENTER. The message “BOOTP DOWNLOAD. WILL COMMIT TO FLASH. REBOOT IN PROGRESS...” displays in the event message line at the top of the screen and the new image is downloaded into FLASH memory.

### 5.16.2 Image File Download Using TFTP

To download FLASH to the SmartMIM-216 using TFTP, proceed as follows:

1. Use the arrow keys to highlight the **Download Method** field.
2. Use the SPACE bar to select **TFTP**.
3. Use the arrow keys to highlight the **TFTP Gateway IP Addr** field.
4. Set the IP address of the TFTP gateway server (this defaults to the same IP address as that set in the TFTP Gateway IP Addr field on the General Configuration screen).
5. Use the arrow keys to highlight the **Download Server IP** field.
6. Enter the IP address of the TFTP server using the DDN format.

   For example: 134.141.79.121
7. Use the arrow keys to highlight the **Download File Name** field.
8. Enter the complete pathway and file name of the image stored on the download server.

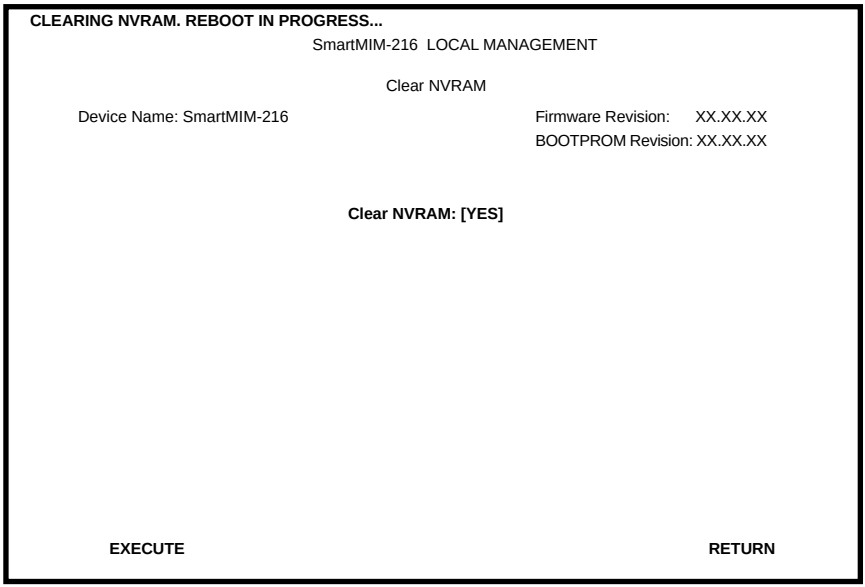
   For example: /tftpboot/SM216.hex
9. Use the arrow keys to highlight **EXECUTE** at the bottom of the screen and press ENTER. The message “TFTP DOWNLOAD. WILL COMMIT TO FLASH. REBOOT IN PROGRESS...” displays in the event message line at the top of the screen and the new image is downloaded into FLASH memory.

## 5.17 CLEAR NVRAM SCREEN


Clearing NVRAM will result in the loss of all user-entered parameters. Do not proceed unless this procedure is completely understood.

The Clear NVRAM screen shown in Figure 5-18 allows the user to clear all user-entered parameters such as the IP address, Interface Configuration, COM Port Configuration and Community Names from NVRAM and reset them to the factory default settings.

Access the Clear NVRAM screen from the Device Specific Configuration Menu screen by using the arrow keys to highlight the **Clear NVRAM** option and pressing ENTER. The Clear NVRAM screen displays.




2007_50

**Figure 5-18 Clear NVRAM Screen**

Clear NVRAM as follows:

1. Use the arrow keys to highlight the **Clear NVRAM** field.
2. Use the SPACE bar to toggle the field to **YES**.

3. Use the arrow keys to highlight **EXECUTE** at the bottom of the screen.
4. Press ENTER. The warning shown in Figure 5-19 displays.

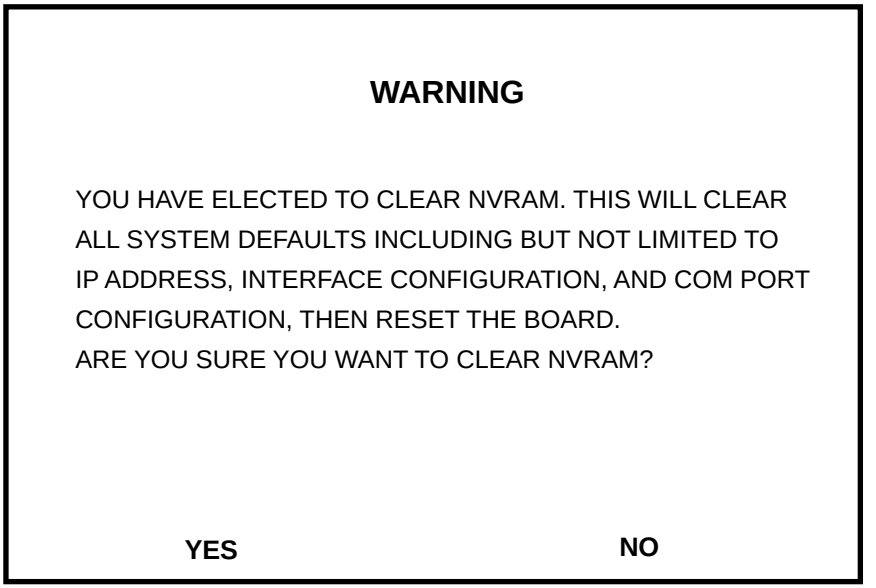


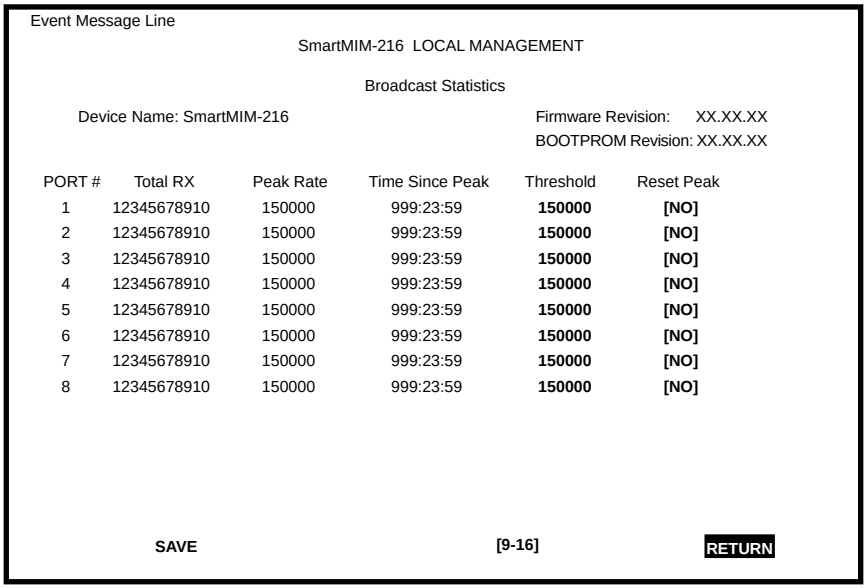

**Figure 5-19 Clear NVRAM Warning Screen**

5. Use the arrow keys to highlight **YES** and press ENTER. The message "CLEARING NVRAM. REBOOT IN PROGRESS..." displays.
6. The SmartMIM-216 clears NVRAM and reboots. All user-entered parameters default to factory default settings.

## 5.18 BROADCAST STATISTICS SCREEN

The Broadcast Statistics screen, Figure 5-20, allows the user to monitor the statistics for each port (total number of broadcast frames received, peak rate, and time since the last peak number of frames received). The user can also set a desired limit of receive broadcast frames per port per second.

Access the Broadcast Statistics screen from the Device Specific Configuration Menu screen by using the arrow keys to highlight the **Broadcast Suppression** option and pressing ENTER. The Broadcast Statistics screen displays.




2007_56

**Figure 5-20 Broadcast Statistics Screen**

The following explains each field of the Broadcast Statistics screen:

**Port #** (Read-only)
Identifies the number of the port.

**Total RX** (Read-Only)
Displays the total number of broadcast frames received.

**Peak Rate** (Read-Only)
Displays the highest number of broadcast frames received in a one second interval.

**Time Since Peak** (Read-Only)
Displays the time since peak rate was achieved.

**Threshold** (Selectable)
Allows the user to set the desired limit of receive broadcast frames that will be forwarded per port per second. To set the Threshold, refer to Section 5.18.1 for details.

**Reset Peak** (Selectable)
Allows the user to reset the peak rate and the time since last peak. To reset the peak rate, refer to Section 5.18.2 for details.

**[1-8]** and **[9-16]** (Navigation Key)
When the Broadcast Statistics screen displays, the current statistics are displayed for the first 8 ports. The **[9-16]** field allows the user to step to a second screen for the same type of information for ports 9 through 16. While on the second screen, the user can navigate back to the first screen by highlighting the **[1-8]** field and pressing ENTER. The user can change the **Threshold** or **Reset Peak** fields while in either the first or second screen.

### 5.18.1 Setting the Threshold

To set the Threshold, proceed as follows:

1. Use the arrow keys to highlight the **Threshold** field for the selected port.
2. Type in the numbers for the desired limit.
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays.

### 5.18.2 Setting the Reset Peak

To set the Reset Peak, proceed as follows:

1. Use the arrow keys to highlight the **Reset Peak** field for the selected port.
2. Press the SPACE bar to select **YES** or **NO**.
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays and the **Time Since Peak** field is also reset.

## 5.19 PORT REDIRECT FUNCTION SCREEN

The Port Redirect Function screen, Figure 5-21, allows the user to set each one of the ports 1 through 16 as a source or destination port. A port can be set to have one or more destination ports. For example, port 1 can be set as a source port with three destinations, ports 2, 3, and 4. Traffic from port 1 is then automatically redirected to ports 2, 3, and 4. Port 1 can also serve as a destination port for other ports. The port redirect function is extremely useful for troubleshooting purposes, as it allows traffic to be sent to a particular port(s) where, with the use of an analyzer or RMOM probe, all current traffic from the source port(s) can be examined.


Although all traffic from the source port (including errored frames) is sent to the destination port, normal switching is still performed for all frames on the source port.

Access the Port Redirect Function screen from the Device Specific Configuration Menu screen by using the arrow keys to highlight the **Port Redirect Function** option and pressing ENTER. The Port Redirect Function screen displays.

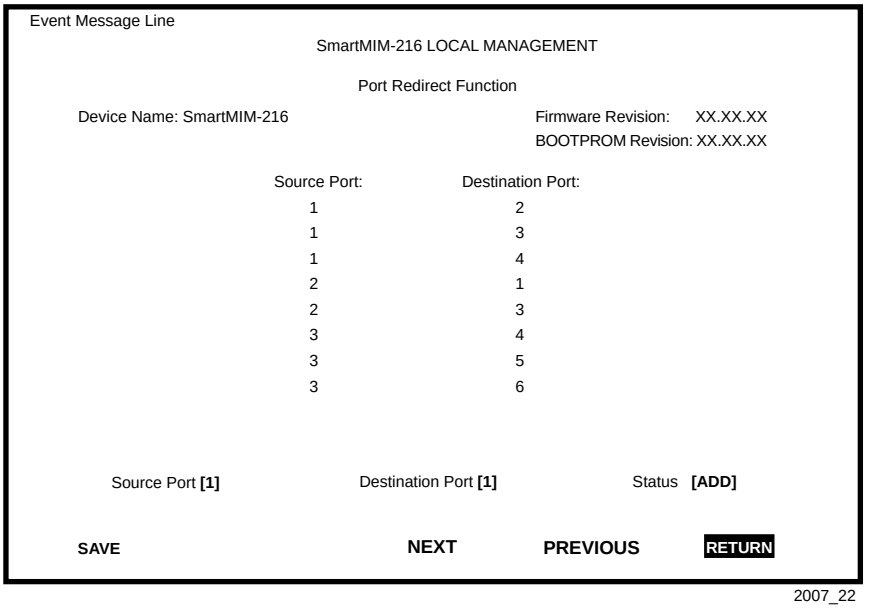



**Figure 5-21 Port Redirect Function Screen**

The following definitions briefly explain each field of the Port Redirect Function screen:

**Source Port** (Read-only)
Shows which ports are currently set as source ports.

**Destination Port** (Read-only)
Shows which ports are currently set as destination ports. Refer to Section 5.19.1 for details about how to display the current entries.

**Source Port [*n*]** (Selectable)
Allows a selected port [*n*] to be changed to a source port. Refer to Section 5.19.2 for details.

**Destination Port [*n*]** (Selectable)
Allows a selected port [*n*] to be changed to a destination port. Refer to Section 5.19.2 for details.

**Status** (Selectable)
Allows the addition or deletion of source and destination ports selected in the **Source Port [*n*]** and **Destination Port [*n*]** fields. Refer to Section 5.19.2 for details.

## 5.19.1 Displaying the Source and Destination Entries

There can be more than one Port Redirect Function screen depending on the number of port redirect entries. Each screen displays up to 10 port redirect entries. If there is more than one screen of redirect entries, the **Next** and/or **Previous** command displays at the bottom of the screen, allowing the user to navigate to either the next or previous screen.

For example, with three screens of entries, the **Next** command displays at the bottom of the first screen. In the second screen, the **Next** and **Previous** commands display. In the last screen, only the **Previous** command displays.

To display the next screen, use the arrow keys to highlight **Next**. Press ENTER and the next screen of entries displays.

To display the previous screen, use the arrow keys to highlight **Previous**. Press ENTER to view the entries in the previous screen.

### 5.19.2 Changing Source and Destination Ports

Add or delete source port and destination port entries as follows:

1. Use the arrow keys to highlight the **Source Port** field.
2. Press the SPACE bar or BACKSPACE one or more times to increment or decrement the port number displayed in the brackets **[n]** until the appropriate port number displays.
3. Use the arrow keys to highlight the **Destination Port** field.
4. Use the SPACE bar or BACKSPACE to step to the appropriate port number for the destination port.
5. Use the arrow keys to highlight the **Status** field.
6. Use the SPACE bar to select either the **ADD** or **DEL** (delete) option. Press ENTER. This adds or deletes the port selections made in steps 2 and 4 and also updates the screen **Source Port** and **Destination Port** list.


To direct more than one port, repeat steps 1 through 6 for each additional setting, then go to step 7 to save all the new settings at once.

7. Use the arrow keys to highlight **SAVE** at the bottom of the screen. Press ENTER. The message “SAVED OK” displays. This saves the new settings and updates the Source Port and Destination Port read-only fields.

## 5.20 SmartTrunk CONFIGURATION

Before discussing the SmartTrunk Configuration screen and how to use it, it is necessary to understand what SmartTrunk is and the port connection and configuration rules that must be followed.

Refer to Appendix D for an overview of how SmartTrunk operates, then refer to the following SmartTrunk configuration rules before configuring the ports using the SmartTrunk Configuration screen described in Section 5.20.2.

### 5.20.1 SmartTrunk Configuration Rules

The following rules must be followed when installing the SmartMIM-216 to operate in a network configuration using SmartTrunking. These rules also apply to other devices that support Cabletron Systems SmartTrunk application.


Failure to follow these rules will produce poor network performance.

1. Only ports designated as NETWORK ports, through local and remote management, will be considered for SmartTrunking.
2. The FNB interfaces **must** be designated as USER ports.
3. If three or more devices are connected together, then the ports that connect any of the two devices together MUST be designated as USER ports to prevent a network loop. The port(s) with the least amount of bandwidth available would be the port(s) that should be designated a USER port.
4. Do not loop front panel ports back to the same chassis on the same module or different modules within that chassis.
5. Enabling Spanning Tree is a requirement before enabling SmartTrunk. Spanning Tree will block any ports not used by SmartTrunk that are looped. This can include NETWORK and USER ports. The reason for blocking a network port is that the port at the other end of the connection may be set as a USER port.

### Other Considerations

The following are items that should be taken into account when using SmartTrunking:

- If a network loop exists and SmartTrunk becomes disabled, and Spanning Tree is operational, then the Spanning Tree algorithm will respond and block the necessary ports.
- If SmartTrunk becomes disabled and a network loop exists, and Spanning Tree is not-operational (disabled), then an infinite packet loop occurs, taking down the network.
- If a port is disabled and as a result SmartTrunk is no longer active, then all traffic is redirected over the remaining port(s).
- If three or more standalone devices or chassis are connected together in a loop condition and all the ports that connect the loop are set to NETWORK, the results are unpredictable. This is deemed an illegal configuration.
- If a network loop exists when a port is disabled, then SmartTrunk will reconfigure the remaining ports and continue to distribute traffic.

## 5.20.2 SmartTrunk Configuration Screen

The SmartTrunk Configuration screen, Figure 5-22, allows the user to logically group interfaces together between devices to achieve greater bandwidth between the devices.

Access the SmartTrunk Configuration screen (Figure 5-22) from the Device Specific Configuration Menu screen by using the arrow keys to highlight the **SmartTrunk Configuration** option and pressing ENTER. The SmartTrunk Configuration screen displays.

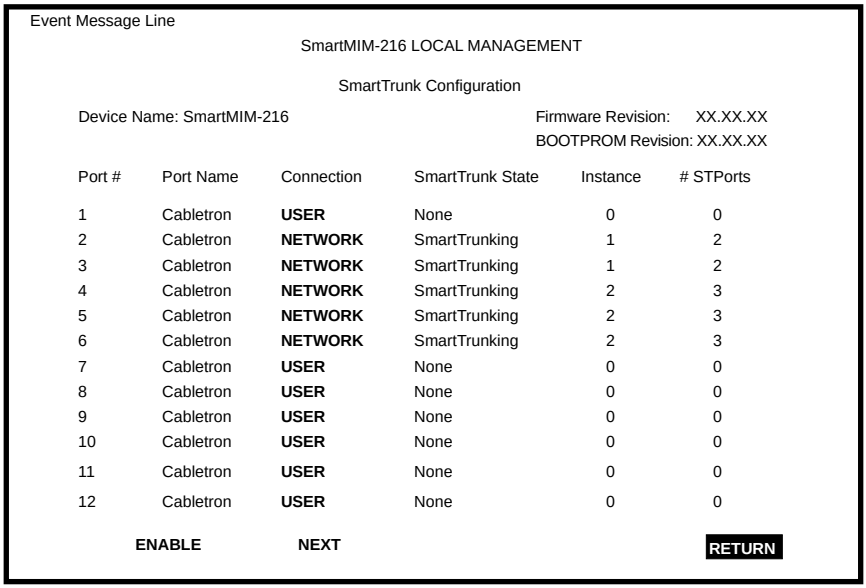



**Figure 5-22 SmartTrunk Configuration Screen**

The following explains each field of the SmartTrunk Configuration screen:

**Port #** (Read-only)
Identifies the number of the port. To display the ports, refer to Section 5.20.3.

**Port Name** (Read-only)
These are the names assigned by Cabletron Systems for all bridging interfaces.

**Connection** (Selectable)
Enables the connection type for the interface. This field toggles between **USER** and **NETWORK**. **USER** connections do not participate in SmartTrunking. All FNB interfaces must be designated as a **USER** connection. **NETWORK** is used for load sharing. At least two ports must be designated as **NETWORK** to do load sharing. To enable/disable a connection, refer to Section 5.20.4.

**SmartTrunk State** (Read-only)
Displays the current operating state of the port — None, Blocking, or SmartTrunking. The following describes there meaning:

| | |
|---|---|
| None | The trunk is operating as a normal bridge port. |
| Blocking | The port is load sharing, but in the blocked mode. While the module performs the function of determining if there is a network loop, data is temporarily blocked on new SmartTrunk ports and any port that becomes newly linked. |
| SmartTrunking | The port is load sharing with other Network designated ports of the same instance. |

**Instance** (Read-only)
Identifies the ports that are grouped together to share traffic load (load sharing). In Figure 5-22, ports 2 and 3 make up a group identified as Instance **1** that together share traffic. Ports 4, 5, and 6 are identified as Instance **2** and also share traffic, but not with Instance **1**.

**# STPorts** (Read-only)
Identifies which ports are grouped (an instance). For example, in Figure 5-22 Instance **1** consists of two ST Ports (ports 2 and 3) and there are three ST Ports (ports 4, 5, and 6) associated with Instance **2**.

### 5.20.3 Displaying the SmartTrunk Ports

There are two SmartTrunk screens. Each screen can display up to 12 ports. The **Next** and/or **Previous** command displays at the bottom of the screen, allowing the user to navigate to either the next or previous screen.

For example, with two screens of entries, the **Next** command displays at the bottom of the first screen. In the second screen, the **Previous** command displays.

To display the next screen, use the arrow keys to highlight **Next**. Press ENTER and the next screen of entries displays.

To display the previous screen, use the arrow keys to highlight **Previous**. Press ENTER to view the entries in the previous screen.

### 5.20.4 Enabling the Connection

To enable the Connection, proceed as follows:

1. Use the arrow keys to highlight the **Connection** field for the selected port(s).
2. Press the SPACE bar to select **USER** or **NETWORK**.
3. Use the arrow keys to highlight the **ENABLE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays.

## 5.21 DEVICE STATISTICS MENU SCREEN

The Device Statistics Menu screen, Figure 5-23, provides access to screens that allow the user to obtain bridge statistics about frame traffic through each interface and view operating statistics about each port.

Access the Device Statistics Menu from the Device Menu screen by using the arrow keys to highlight the **Device Statistics Menu** option and pressing ENTER. The Device Statistics Menu screen displays.

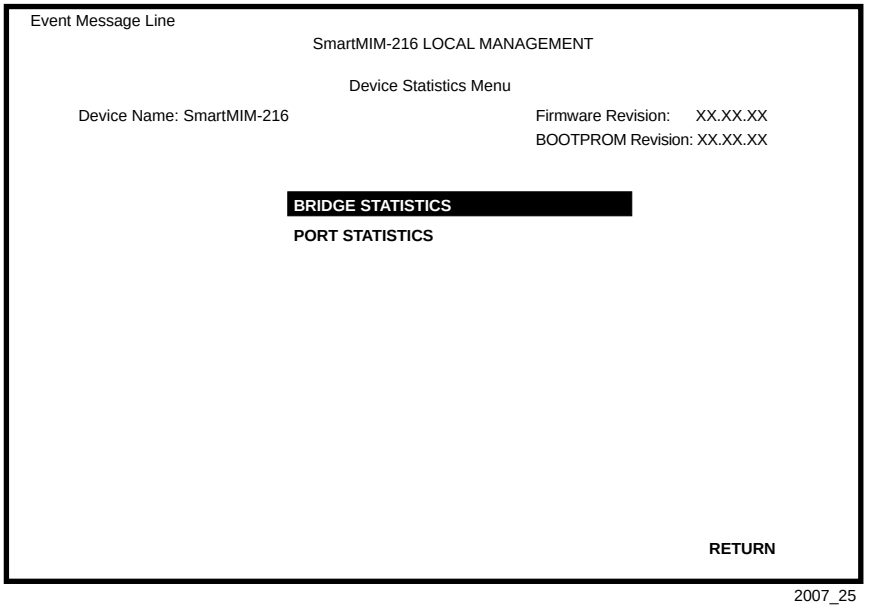



**Figure 5-23 Device Statistics Menu Screen**

The Device Statistics Menu screen displays the following menu items:

**BRIDGE STATISTICS**
The Bridge Statistics screen lists the number of frames received, transmitted, filtered, and forwarded by each interface.

**PORT STATISTICS**
The Port Statistics screen provides the operating statistics of each port on a port-by-port basis.

## 5.22 BRIDGE STATISTICS SCREEN

The Bridge Statistics screen, Figure 5-24, lists the number of frames received, transmitted, filtered, and forwarded by each interface.

Access the Bridge Statistics screen from the Device Statistics Menu screen by using the arrow keys to highlight the **Bridge Statistics** option and pressing ENTER. The Bridge Statistics screen displays.

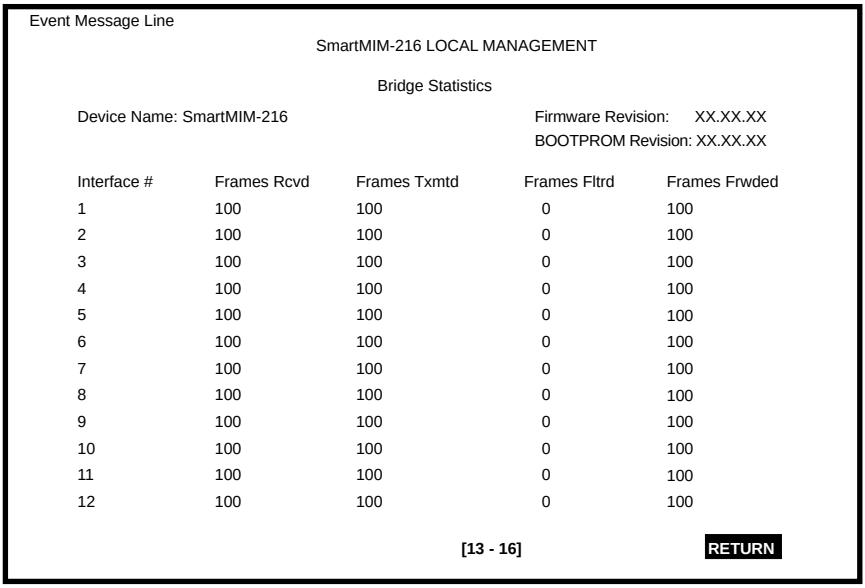



**Figure 5-24 Bridge Statistics Screen**

The Bridge Statistics screen displays the following items:

**Interface #** (Read-Only)
Identifies the interface or port number.

**Frames Rcvd** (Read-Only)
Displays the number of frames received by the interface since last power-up or reset.

**Frames Txmtd** (Read-Only)
Displays the number of frames transmitted by the interface since last power-up or reset.

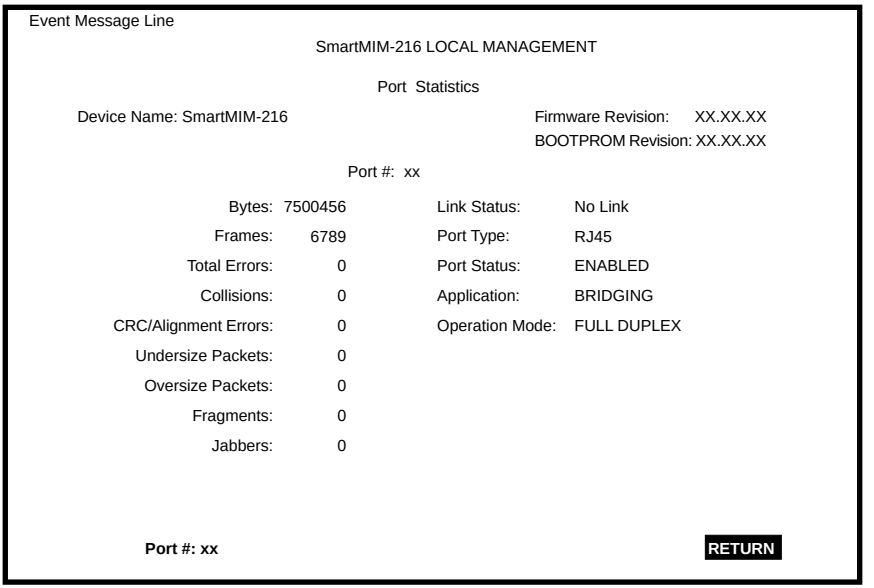
**Frames Fltrd** (Read-Only)
Displays the number of frames filtered by the interface since last power-up or reset.

**Frames Frwded** (Read-Only)
Displays the number of frames forwarded by the interface since last power-up or reset.

## 5.23 PORT STATISTICS SCREEN

Operating statistics for each port, on a port-by-port basis, are viewed through the Port Statistics screen shown in Figure 5-25.

Access the Port Statistics screen by using the arrow keys to highlight the **Port Statistics** option on the Device Statistics Menu screen and pressing ENTER. The Port Statistics screen displays.




20071_28

**Figure 5-25 Port Statistics Screen**

The following definitions explain each field of the Port Statistics screen:

**Port #** (Selectable)
Indicates the current port for which statistics are displayed. To select a port, refer to Section 5.23.1.

**Bytes** (Read-only)
Displays the number of bytes transmitted and received.

**Frames** (Read-only)
Displays the number of frames transmitted and received.

**Total Errors** (Read-only)
Displays the total number of errors on this port.

**Collisions** (Read-only)
Displays the total number of collisions detected on this port.

**CRC/Alignment Errors** (Read-only)
Displays the number of packets with bad Cyclic Redundancy Checks (CRC) received from the network. The CRC is a 4-byte field in the data packet that ensures that the data that is received is the same as the data that was originally sent. Alignment errors are due to misaligned packets.

**Undersize Packets** (Read-only)
Displays the number of packets received with a valid CRC and whose size was less than the minimum Ethernet frame size of 64 bytes (not including the preamble).

**Oversize Packets** (Read-only)
Displays the number of packets received with a valid CRC and whose size exceeded 1518 data bytes (not including the preamble).

**Fragments** (Read-only)
Displays the number of received packets with less than the minimum number of bytes or received packets with less than 64 bytes (excluding framing bits, but including FCS bytes) that had a bad Frame Check Sequence (FCS) and an invalid CRC.

**Jabbers** (Read-only)
Displays the total number of Jabber conditions detected on this port.

**Link Status** (Read-only)
Displays either Link, No Link or N/A.

**Port Type** (Read-only)
Displays RJ45, for 10 Mbps ports, and FE-100TX, FE-100FX, or FE-100F3, as appropriate.

**Port Status** (Read-only)
Indicates the status of the selected port. Possible displays are ENABLED and DISABLED.

**Application** (Read-only)
Displays BRIDGING, indicating that the port is operating as a bridge.

**Operation Mode** (Read-only)
Displays one of the following values:

- STANDARD ENET – The port can either transmit data or receive data, but not both at the same time. The port is running at 10 Mbps.
- FULL DUPLEX – The port can transmit and receive data at the same time. The port can process 20 Mbps of data.

**Port #**
Allows the user to select the port number to be viewed.

### 5.23.1 Displaying Port Statistics

To display the statistics for any port, proceed as follows:

1. Use the arrow keys to highlight the **Port #** field.
2. Press the SPACE bar to increment (or press the DEL (delete) key to decrement) the port number.
3. Press ENTER (neither the **Port #** field nor the statistics will change until ENTER is pressed).

## 5.24 NETWORK TOOLS

The Network Tools function resides on the SmartMIM-216 and allows the user to access and manage network devices. Figure 5-26 shows the Network Tools Help screen.

Access the Network Tools screen by using the arrow keys to highlight the **Network Tools** screen in the Device Menu screen and pressing ENTER. The Network Tools screen displays.

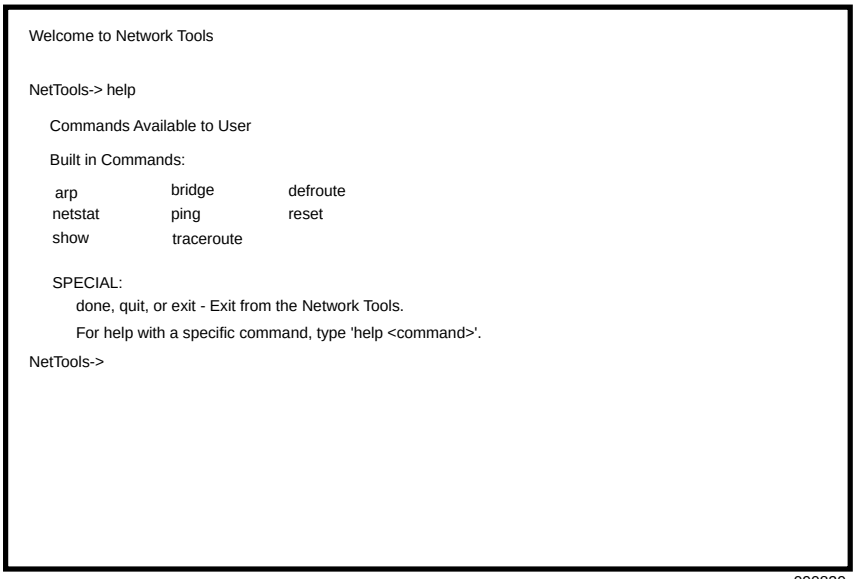
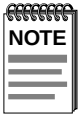



**Figure 5-26 Network Tools Help Screen**

The Network Tools functions are performed using a series of commands. Entering commands in Network Tools involves typing the command to be executed at the Network Tools prompt, adding any desired or required extensions, and pressing ENTER.

There are two categories of commands in the command set.

- Built-in Commands – Allow the user to access and manage network devices. The commands are: **arp**, **bridge**, **defroute**, **netstat**, **ping**, **reset**, **show**, and **traceroute**.
- Special Commands – Allow the user to exit from Network Tools. The commands are **done**, **exit**, and **quit**.




The conventions used here to describe Network Tools are as follows:

Information entered by user is in **bold helvetica font**.

Arguments enclosed by [ ] are required.

Arguments enclosed by < > are optional.

To abort the output or interrupt a process, press the CONTROL key and c key simultaneously, designated as ^C here.

The commands are presented in the following format:

**command**

| | |
|---|---|
| **Syntax:** | Shows the required command format. It indicates where arguments, if any, must be specified. |
| **Description:** | Briefly describes the command and its uses. |
| **Options:** | Lists any additional fields in the appropriate format which may be added to the command. |
| **Example:** | Shows an example of the command. |

### 5.24.1 Built-in Commands

The built-in commands listed in this section activate functions on the LM managed device or devices being accessed through Network Tools.

**arp**

**Syntax:** arp <options>

**Description:** The arp command provides access to the ARP (Address Resolution Protocol) cache, enabling you to view cache data, delete entries, or add a static route. Super-user access is required to delete an entry or add a static route.

Each ARP cache entry lists the network *interface* that the device is connected to, the device's *network address* or IP address, the device's *physical address* or MAC address, and the *media type* of connection to the device. Media types are displayed as numbers, which stand for the following states:

1 - Other
2 - Invalid entry (cannot ping device, timed out, etc.)
3 - Dynamic route entry
4 - Static route entry (not subject to change)

You can specify the arp command without options, or with one of the following options:

**Options:**
-a View cache data
-d Delete an IP address entry. Requires additional arguments: <Interface Number> <IP address>
-s Adds a static entry. Requires additional arguments: <Interface Number> <IP address> <MAC address>
-f Flush the ARP cache

**Example:**

```
NetTools-> arp -a
# Interface        Network Address     Physical Address    Media Type
# (SonicInt)       122.144.40.111      00.00.0e.12.3c.04   3(dynamic)
# (SonicInt)       122.144.48.109      00.00.0e.f3.3d.14   3(dynamic)
# (SonicInt)       122.144.52.68       00.00.0e.12.3c.04   3(dynamic)
# (SonicInt)       122.144.21.43       00.00.0e.03.1d.3c   3(dynamic)


NetTools-> arp -d 1 122.144.52.68


NetTools-> arp -s 1 22.44.2.3 00:00:0e:03:1d:3c


NetTools-> arp -f
```

051467

## bridge

**Syntax:** bridge [ENABLE/DISABLE] [IFNUM/ALL]

**Description:** The bridge command allows bridge management to be enabled or disabled at the user's request, either one at a time or all at once. Specifying a single interface number will affect the bridging status of that interface, while specifying ALL will affect every interface.

**Options:** Not Applicable

**Example:**

```
NetTools-> bridge disable all

NetTools-> bridge enable 1

NetTools-> bridge disable 1
```

051468

## defroute

**Syntax:** defroute [interface number] [IP address]

**Description:** The defroute command allows the user to view, set or delete the default IP route to a managed device through the specified interface.

**Options:** Not Applicable

**Example:**

```
NetTools-> defroute 2 147.152.42.32
```

051469

## netstat

**Syntax:** netstat [option]

**Description:** The netstat command provides a display of general network statistics for the managed device. The netstat command must be used with one of the two display options.

**Options:** -i Displays status and capability information for each interface.

-r Displays routing information for each interface.

**Example:**

```
NetTools-> netstat -i
Interface + Description     MTU     Speed      Admin  Oper  MAC Addr

# 1 (ethernet -csmacd)      1514    10000000   up     up    0x00 0x00 0x1d 0x07 0x50 0x0e
# 2 (ethernet - csmacd)     1514    10000000   up     up    0x00 0x00 0x1d 0x07 0x50 0x0f
# 3 (ethernet - csmacd)     1514    10000000   up     up    0x00 0x00 0x1d 0x07 0x50 0x10
# 4 (ethernet - csmacd)     1514    10000000   up     up    0x00 0x00 0x1d 0x07 0x50 0x11

NetTools-> netstat -r
Destination          Next-hop              Interface

# Default Route      DirectConnection      1
# 134.141.0.0        DirectConnection      2
# 134.141.0.0        DirectConnection      3
```

051470

### ping

**Syntax:** ping [IP address]

**Description:** The ping command generates an outbound ping request to check the status (alive/not alive) of a device at a specified IP address.

**Options:** Not Applicable

**Example:**

```
NetTools-> ping 122.144.40.10
122.144.40.10 is alive
```

051471

### reset

**Syntax:** reset

**Description:** The reset command allows a soft reset of the device. The user will be queried to confirm the reset command to ensure against unwanted resets.


The Network Tools connection to the device will be terminated upon execution of this command.

**Options:** Not Applicable

**Example:**

```
NetTools-> reset
```

174245

## show

**Syntax:** show <PROTOCOL> <TABLE>

**Description:** The show command displays information concerning various components of the device. Protocols currently supported are IP, IPX, DECnet, and AppleTalk. Components of those protocols that are currently supported are ARP caches, route tables, FIB tables, server tables, and interface tables. The number of valid entries in the table will be displayed at the end of the table display.

**Options:** Not Applicable

**Example:**

```
NetTools-> show Appletalk interfaces

# Interface   AdminStatus   OperStatus   MTU    Forwarding   Framing
# 1           enabled       enabled      1500   enabled      ethernet
# 2           disabled      disabled     1500   disabled     ethernet


NetTools-> show IP ARP

# Interface   MediaType     PhysicalAddress     NetworkAddress
# 3           3 (dynamic)   00:00:1d:04:40:5d   123.456.40.1
# 4           3 (dynamic)   08:00:20:0e:d8:31   123.456.40.30
```

174246

**traceroute**

**Syntax:** traceroute [IP address]

**Description:** The traceroute command generates a TRACEROUTE request to a specified IP address and provides a display of all next-hop routers in the path to the device. If the device is not reached, the command displays all next-hop routers to the point of failure.

**Options:** Not Applicable

**Example:**

```
NetTools-> traceroute 122.144.11.52

# next-hop[0] : 122.144.60.45
# next-hop[1] : 122.144.8.113
# next-hop[2] : 122.144.61.45
# 122.144.11.52 is alive : 3 hops away.
```

051477

## 5.24.2 Special Commands

**done, exit, quit**

**Syntax:** done, exit, or quit

**Description:** The done, quit, or exit commands enable the user to exit from Network Tools and return to the Main Menu screen.

**Options:** Not Applicable

**Example:**

```
NetTools-> done

Connection closed
```

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# APPENDIX A
# SPECIFICATIONS

This appendix provides operating specifications for the Cabletron Systems SmartMIM-216. Cabletron Systems reserves the right to change these specifications at any time without notice.

## A.1 DEVICE SPECIFICATIONS

| | |
|---|---|
| Processor: | Intel i960 RISC processor |
| Dynamic Random Access Memory (DRAM): | 8 MB |
| FLASH Memory: | 4 MB |

## A.2 PHYSICAL PROPERTIES

| | |
|---|---|
| Dimensions: | 29.21H x 5.08W x 34.04D (cm)<br>11.5H x 2W x 13.4D (in) |
| Weight (Unit): | 1.38 kg (3.07 lb) |
| MTBF (Predicted): | 200,000 hours |

## A.3 ENVIRONMENTAL REQUIREMENTS

| | |
|---|---|
| Operating Temperature: | 5° to 40°C (41° to 104°F) |
| Storage Temperature: | -30° to 73°C (-22° to 164°F) |
| Operating Relative Humidity: | 5% to 90% |

## A.4 INPUT/OUTPUT PORTS

| | |
|---|---|
| Ports 1 through 14: | Ethernet (10BASE-T compliant) with RJ45 type connectors. |
| Slots for optional ports 15 and 16: | Slots accept two types of optional Fast Ethernet Interface Modules: the FE100-TX and the FE100-FX. |

## A.5 COM PORT/PIN ASSIGNMENTS

The COM port is a serial communications port that supports Local Management or connection to a UPS.

The COM port has the following pin assignments:

**Table A-1 COM Port Pin Assignments**

| Pin | Signal Name | Input/Output |
|---|---|---|
| 1 | Transmit Data (XMT) | Output |
| 2 | Data Carrier Detect (DCD) | Output |
| 3 | Data Set Ready (DSR) | Input |
| 4 | Receive Data (RCV) | Input |
| 5 | Signal Ground (GND) | NA |
| 6 | Data Terminal Ready (DTR) | Output |
| 7 | Request to Send (RTS) | Input |
| 8 | Clear to Send (CTS) | NA |

## A.6 REGULATORY COMPLIANCE

### Safety

The SmartMIM-216 meets the safety requirements of UL 1950, CSA C22.2 No. 950, EN 60950, IEC 950, and 73/23/EEC.

### Electromagnetic Compatibility (EMC)

The SmartMIM-216 meets the EMC requirements of FCC Part 15, EN 55022, CSA C108.8, VCCI V-3/93.01, EN 50082-1, and 89/336/EEC.

# APPENDIX B

# FE-100TX, FE-100FX, AND FE-100F3 SPECIFICATIONS

The SmartMIM-216 supports three Fast Ethernet Interface Modules:

- FE-100TX
- FE-100FX
- FE-100F3

This appendix provides the specifications for these modules.

## B.1 FE-100TX

The FE-100TX uses an RJ45 connector supporting Unshielded Twisted Pair (UTP) cabling.

The slide switch on the FE-100TX determines the crossover status of the cable pairs. If the switch is on the **X** side, the pairs are internally crossed over. If the switch is on the **=** side, the pairs are not internally crossed over. Figure B-1 shows the pinouts for the FE-100TX in both positions.

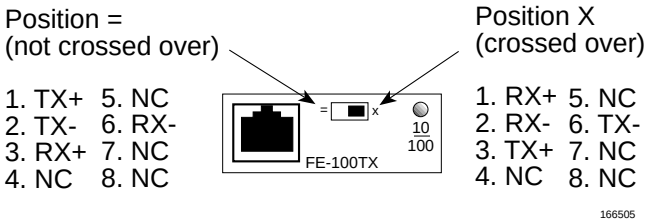


**Figure B-1 FE-100TX Pinouts**

## B.2 FE-100FX

The FE-100FX shown in Figure B-2 uses an SC style connector that supports multimode fiber optic cabling. Specifications for the FE-100FX are listed in Table B-1 below.

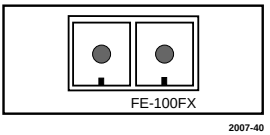


**Figure B-2 FE-100FX**

**Table B-1 Transmitter Power**

| Cable Type | Worst Case Budget | Typical Budget |
|---|---|---|
| 50/125 µm fiber optic | 6.0 dB | 9.0 dB |
| 62.5/125 µm fiber optic | 9.0 dB | 12.0 dB |
| 100/140 µm fiber optic | 15.0 dB | 18.0 dB |


The transmitter power levels and receive sensitivity levels listed are peak power levels after optical overshoot. A peak power meter must be used to correctly compare the values given above to those measured on any particular port. If power levels are being measured with an average power meter, add 3 dB to the measurement to compare the measured values to the values listed above.

## B.3 FE-100F3

The FE-100F3 shown in Figure B-3 uses an SC style connector that supports single mode fiber optic cabling. Specifications for the FE-100FX are listed in Table B-2 below.

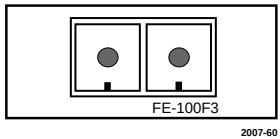


**Figure B-3 FE-100F3**

**Table B-2 Transmitter Power**

| Cable Type | Worst Case Budget | Typical Budget |
|---|---|---|
| 8/125 μm fiber optic | >10.0 dB | <10.0 dB |
| 12.5/125 μm fiber optic | >10.0 dB | <10.0 dB |


The transmitter power levels and receive sensitivity levels listed are peak power levels after optical overshoot. A peak power meter must be used to correctly compare the values given above to those measured on any particular port. If power levels are being measured with an average power meter, add 3 dB to the measurement to compare the measured values to the values listed above.

# APPENDIX C

# FAST ETHERNET INTERFACE MODULES INSTALLATION

This appendix covers the installation of the FE-100TX, FE-100FX, and FE-100F3 Fast Ethernet Port Interface Modules. The SmartMIM-216 must be removed from the chassis before attempting to install either of the modules. Once the SmartMIM-216 is removed from the chassis, the only tool required is a Phillips screwdriver.


The Fast Ethernet Interface Module and the SmartMIM-216 are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could damage the module or the SmartMIM-216.

If the FE-100TX, FE-100FX, or FE-100F3 is being installed into a SmartMIM-216 that is already installed, perform the following, before continuing, otherwise proceed with Section C.1:


The FE-100F3 uses Class 1 lasers. Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.

- Disconnect the SmartMIM-216 from the network.
- Remove power from the chassis (refer to chassis user's guide).
- Remove the SmartMIM-216.

## C.1 INSTALLING OPTIONAL FAST ETHERNET INTERFACE MODULES

Figure C-1 shows the location of the Fast Ethernet Interface Module connectors on the SmartMIM-216 board for port slots 15 and 16.

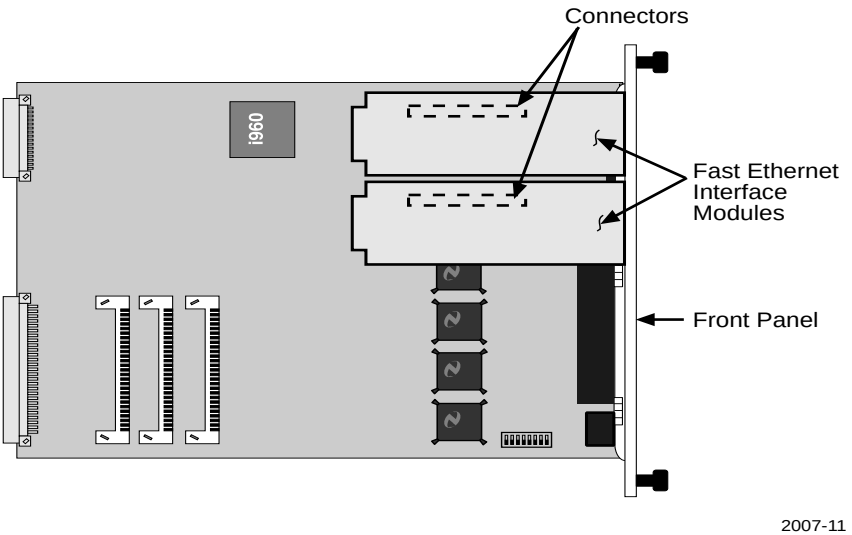


**Figure C-1 Fast Ethernet Interface Module Connector Location**

To install a Fast Ethernet Interface Module in port slot 15 or 16, proceed as follows:


The Fast Ethernet Interface Module and the SmartMIM-216 are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could damage the module or the SmartMIM-216.


When installing Fast Ethernet Interface Modules in both port slots 15 and 16, remove the coverplates from both slot openings. In the following instructions, the optional module is shown being installed in port slot 16.

1. Remove the coverplate from the port slot where the Fast Ethernet Interface Module will be installed. Refer to Figure C-2 and proceed as follows:

   a. Remove the two screws fastening the coverplate to the standoffs. Save the screws.

   b. Lift and remove the coverplate from the top of the front standoffs.

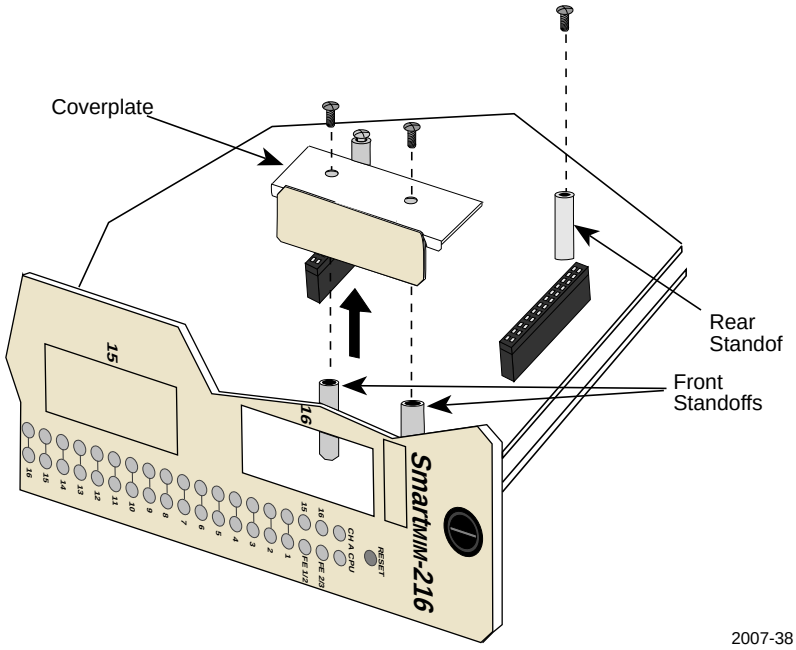


**Figure C-2 Coverplate Removal**

2. Remove the screw from the rear standoff. Save the screw.


When installing an FE-100FX or FE-100F3 module into the SmartMIM-216, remove the rubber plug on the module before proceeding.

3. See Figure C-3. Gently pull the faceplate of the SmartMIM-216 forward to allow room for the Fast Ethernet Interface Modules to be aligned over the connector.

CAUTION

In the following step, take care when inserting the Fast Ethernet Interface Module into the Motherboard connector, so that the pins do not bend. Otherwise, the Fast Ethernet Interface Board and the Motherboard could be damaged.

4. Carefully lower the Fast Ethernet Interface Module onto the standoffs while inserting the module connector into the associated motherboard connector.

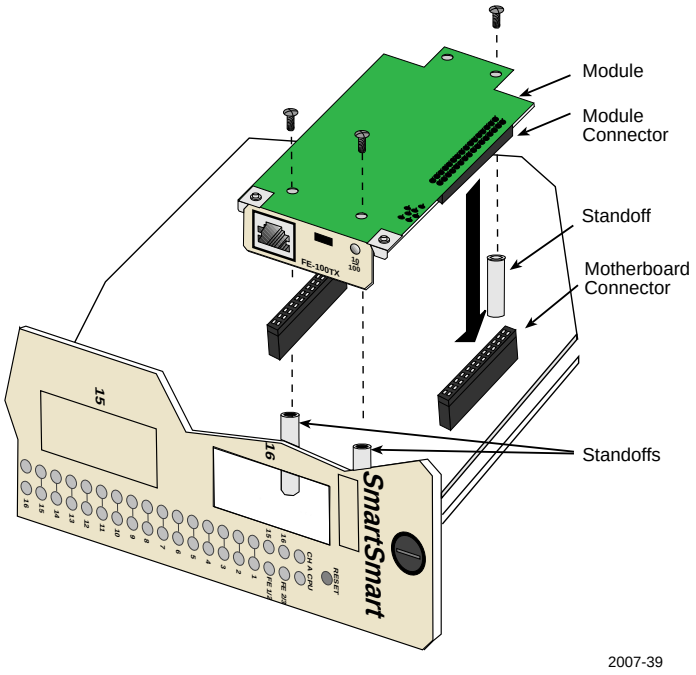


**Figure C-3 Installing the Fast Ethernet Interface Module**

5. Press down firmly on the Fast Ethernet Interface Module until the pins slide all the way into the motherboard connector. Ensure that the Fast Ethernet Interface Module seats flush on the standoffs.

6. Secure the Fast Ethernet Interface Module with the screws saved in steps 1 and 2.

7. Installation is complete; perform the SmartMIM-216 installation detailed in Chapter 3.

# APPENDIX D
# ABOUT SmartTrunk

## D.1 INTRODUCTION

SmartTrunk, also referred to as SmartTrunking, is Cabletron Systems' terminology for load balancing or load sharing. The SmartTrunk application uses a multicast proprietary packet. During initialization, SmartTrunk registers with the host interface to receive all unknown destinations and SmartTrunk packets. When SmartTrunk is enabled, it starts sending packets every two seconds to each SmartTrunk port that is linked and enabled in order to determine the network topology. While SmartTrunk performs this function, data is temporarily blocked on new SmartTrunk ports and any port that becomes newly linked. If SmartTrunk determines that there are network loops, it temporarily disables the looped ports via Spanning Tree, then it begins to forward data.

## D.2 MULTIPLE INSTANCED CHASSIS


The following sections use terms that are described in Section 5.20.2 in the Local Management (LM) chapter of this document.

Figure D-1 shows a simple example of a network using Cabletron Systems devices that support SmartTrunking. In this example, a module supporting SmartTrunking in an MMAC-Plus chassis has multiple instances (groups of ports using SmartTrunking). All devices participating in SmartTrunking must have SmartTrunk enabled. This includes the ports of the device at each end of connected segments. If only the ports at one end of the connected segments is enabled, then the redundant paths are blocked via Spanning Tree.

In Figure D-1, the SmartMIM-216 in the MMAC-M8FNB chassis does not know anything about the SmartTrunk status of the SmartSwitch 2200 or vice versa. However, the MMAC-Plus knows about both the SmartMIM-216 and the SmartSwitch 2200 and thus has multiple instances when viewing LM, NMS (Network Management Software), or WebView screens.

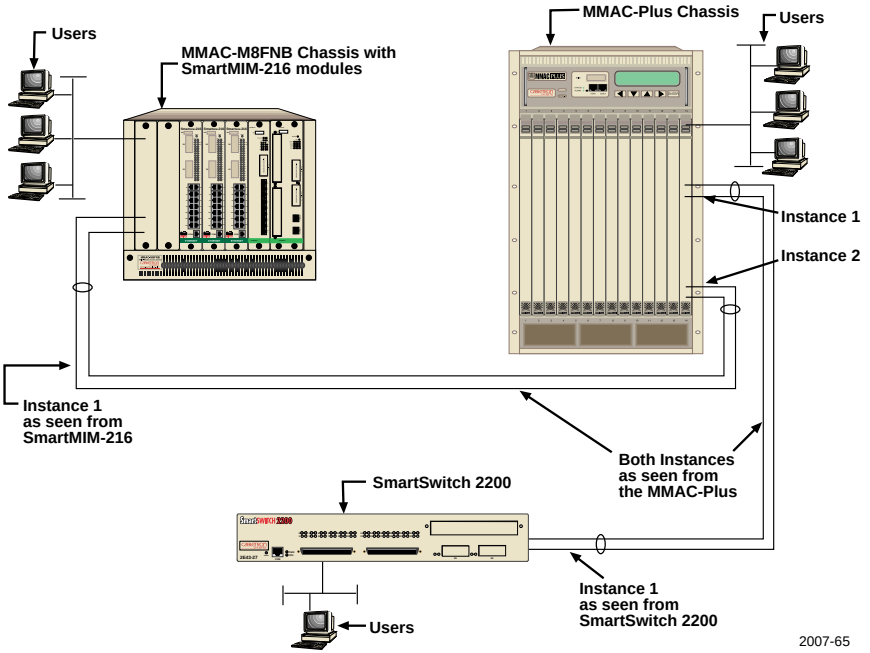


**Figure D-1 Multiple Instanced Module with SmartTrunk Enabled**

## D.3 SmartTrunk AND PORT CONNECTIONS

The SmartTrunk application dynamically determines network loops and is used concurrently with the Spanning Tree protocol. The SmartTrunk application ONLY knows about its neighboring switches. If a user goes through several switch hops and then loops back to the first switch hop (creating a loop), the common connections between two switches (any two) must be configured as USER or a loop will occur, see Figure D-2.

Configurations that use USER ports do not use SmartTrunking. With Spanning Tree enabled, the USER defined port(s) go into a blocking mode in a looped topology. To safeguard against loops, Spanning Tree must be enabled. Configuring ports as USER lets the SmartTrunk application know that it will not use these ports as SmartTrunking ports if they are part of a loop.

In Figure D-2 the connections marked with an **X** between the SmartMIM-216 and the MMAC Plus Chassis are configured as USER ports. All of the remaining connections between all of the remaining chassis are configured as NETWORK connections, allowing the use of SmartTrunking across all of those ports.

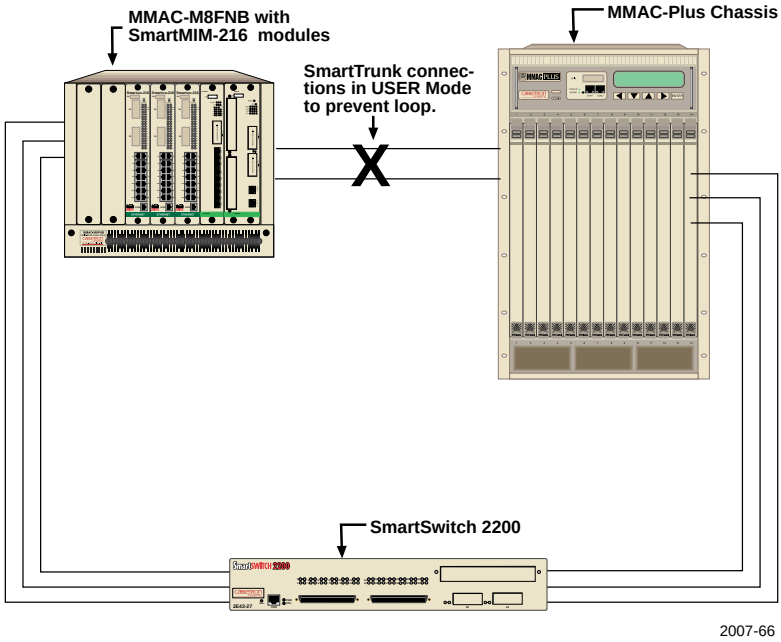


**Figure D-2 SmartTrunk with a Network Loop**

A network administrator can select and preconfigure each port connection field to be NETWORK without enabling SmartTrunk. This will be saved in NVRAM, and later when SmartTrunk is enabled, SmartTrunking will be operational on those ports. If SmartTrunk is enabled and all port connections are not configured, then the port connections remain in the USER connection mode.

When SmartTrunk is enabled on a device, the default for port connections is USER. Ports that are connected as USER to other modules in a different chassis and are in a loop configuration will be in blocking mode until they are configured as NETWORK connections. SmartTrunking only operates on ports set for NETWORK. In a device where a port may be designated as an FNB port, that port should not be configured as a NETWORK port. For a list of all the SmartTrunk rules, refer to Section 5.20.1.

Port costs are considered by SmartTrunking when disabling SmartTrunking on interfaces. SmartTrunk will use the lower path costs of the interfaces.

# INDEX

## E



## F



## G



## H

## S



## T



## U